CUMMINGUTILITIES
Sewer - Storm - Water

WATER MASTER PLAN 2040

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EXECUTIVE SUMMARY

2022 Plan Updates

This 2022 update to the City of Cumming Water Master Plan adopted in 2003, 2012 and 2017 provides an overview of accomplishments over the past five years as well as revisions to projections of future needs until the year 2040. As one of the fastest growing communities in the country, the City of Cumming requires this Water Master Plan (Plan) to aid policy makers in improving service for its current 62,000 customers as well as outline capital funding for system improvements as service demands require. This Plan includes inventory details, strategies, and recommendations for both effective and reliable water supply and water conservation.

This Plan serves as the local component of a larger planning effort by the Metropolitan North Georgia Water Planning District (MNGWPD), the Atlanta Regional Commission (ARC) and the Georgia North Mountains Commission as one of 12 districts created by the state to assist implementation of regional water, sewer, and storm water planning. Forsyth County is one of the 15 counties within the MNGWPD. The district created three regional plans to provide policies and guidance to protect water resources across the full cycle process of raw water withdrawal, potable water use and treated wastewater return.

Key additions in this Plan update include a revised Capital improvement Plan and an extended planning window to 2040. Additions and enhancements include updated water demand forecasts, asset vulnerability, emergency water plans, review of water conservation measures and integrated recommendations with the sewer and storm master plans. Recommendations in the Capital Improvement Plan section are now provided at the front of the Plan in tabular format for ease of use.

The last adopted version of this Plan was in 2017. This five-year update assesses current issues and changes for critical areas as well as identifies deficiencies in the water system. This Plan follows the guidance provided in the most current 2022 MNGWPD plans and amendments.

Cumming's Department of Utilities continues to provide high quality potable water with over 390-miles of water mains. The distribution network is supplied from the City's 105 MGD Lake Lanier Raw Water Intake Facility (RWIF) and 24 MGD Potable Water Production Facility (PWFP). The City also currently maintains 6.8 MG of storage in its distribution system.

Accomplishments

Since the last adopted Water Master Plan in 2017, the City of Cumming has implemented numerous infrastructure improvements and programs. Some of the accomplishments that had a significant impact on the system include:

Installation of 42-inch Raw Water Main along Pilgrim Mill Road to coincide with the road widening project significantly increases the hydraulic capacity to provide raw water to the City's Potable Water Production Facility (PWPF). This project, due to the bid in Spring 2017, coupled with the additional 900-HP raw water pump will provide the raw water the City needs through the year 2040.

Installation of 2.0 MG Water Storage Tank along the west side of Georgia 400 within the property limits of a City of Cumming Park and Ride facility. The 2.0 MG tank is serving the surrounding area and the proximity to Northside Forsyth Hospital is also an advantageous location to provide direct feed to the hospital during emergencies. Additionally, Forsyth County pumps a significant amount of water out of the City's system just east of Georgia 400 on Old Atlanta Road. A storage tank in this area provides an ample supply of water and alleviate the pressure reduction problems created by the County's high pumping rate. The 2.0 MG "Cumming Home" water tower project took First Place in the 2020 ACI Awards Competition for Georgia in Public Works.

In order to divert water further toward the 2.0 MG tank and beyond the two Ridge Road tanks, valves on these two tank feed lines have been throttled to restrict the flow. There will be periods when these two tanks remain full as the higher Hydraulic Grade Line (HGL) rises above elevation 1421 MSL to allow water to fill the 2.0 MG tank. Additionally, a throttling valve with SCADA controls has been installed on the 16-inch line on Highway 9 near the Water Distribution Building. The valve is operated based on tank levels with secondary controls for low system pressures. In addition to benefiting the southern portion of the City's service area, throttling a valve also allows improved cycling rates for stored water in the State Barn tank.

Installation of Westside 36-Inch Water Transmission Main south along Tribble Gap Road around the City of Cumming downtown area, along Castleberry Road and, finally, east along Hutchinson Road to the location of the 2.0 MG Water Storage Tank. The installation of the 36-inch water main provides additional hydraulic capacity to the south portion of the City of Cumming water system by adding piping from the water treatment plant to the area of high water demand, connecting the 2.0 MG water storage tank to the system, and further strengthen the water supply to a critical hospital complex.

Installation of Mountain Road 0.25 MG Water Storage Tank and Booster Pump Station at Mountain Road and Hughes Drive. The water tank not only serves the residential area along Sawnee Oaks Lane and Hughes Drive, but also serves the future development on the south and west side of Sawnee Mountain.

Installation of City of Cumming Water Plant Chemical Feed System at the Potable Water Production Facility (PWPF). This project includes new buildings and chemical systems to convert existing chemical systems into SCADA controlled liquid feed chemical systems. It includes the conversion of gaseous chlorine disinfection for liquid Sodium Hypochlorite disinfection.

Cumming 2020 Water Plant Improvements at the Potable Water Production Facility (PWPF). The installation of an energy dissipating valve between the 6.0 MGD peaking plant and the clearwells helps reducing and controlling the water pressure when finished water flows from the peaking plant down to the clearwells. The installed Powdered Activated Carbon (PAC) silo system located on the same property of the raw water pump station on the south side of Hwy 9 efficiently reduced the taste and odor problem of the drinking water.

Cumming Received WaterFirst Designation in August 2021 based on numerous accomplishments, including the city's ability to ensure a dedicated water supply to the service area, particularly the local hospital; supply raw water for meeting both the City and Forsyth County's needs; and the city's commitment to keeping Lake Lanier clean.

Water System Assets Value and Renew & Replacement

The need for renewal and replacement of components in the water distribution and treatment systems is often disregarded. The benefits of renewal and replacement are often not presented effectively, and it is always easy to cut associated maintenance budgets or programs.

Assets typically depreciate every 25 years or approximately 4% per year, meaning budget should be allocated on a yearly basis for renewal and replacement projects. In 2021, the value of the Cumming sewer system was estimated to be $74,594,004, including $18,257,691 non-depreciable assets and $56,336,312 depreciable assets. For annual budgetary renewal and replacement projects, it is recommended that 4% of the value of depreciable assets or $2,253,452 be included in the overall operating budget to continually improve the condition of the water distribution system assets, replace equipment at the water storage tanks, booster pumping stations or treatment plants, and improve distribution system capacity. The renewal and replacement budget should be in addition to the annual capital improvement plan budget.

According to the water loss audit records from the past years, leakage is the main cause of water losses in Cumming's water distribution system. The leakage can occur when pipes breaks, when system is incorrectly operated (keep the distribution system at an excessive high pressure, open /close valves to rapidly, or etc.), when old or defective materials are used, and most importantly, when a pipe degrades over time, leaks can occur at the fittings and joints of the pipes.

Renewal and replacement projects of old or incorrectly installed pipes, equipment, and storage facilities will reduce the leakage in the water distribution system and thus reduce the water loss.

Capital Improvement Plan

While many improvements have been made to the system over the past five years, the City of Cumming understands additional key projects will be required so that capacity and infrastructure are in place as the region grows. Improvements will be needed to sustain the high levels of customer service while improving water quality and protecting water resources. Population growth will add increased water demand on the existing system, coupled with expanded service for many areas. In addition to these factors, deficiencies in the system arose during the drought of summer 2016. The most critical projects are described below.

Increased finished water storage. The clearwell storage at the PWPF is high priority improvements the City should implement for water conservation and drought contingency planning, as well as increasing reliability for the city's system.

A good estimate for clearwell volume is 25% of filtration capacity. Since the City's PWPF filtration capacity is slightly greater than 24 MGD, the necessary volume is 6 MG. The City currently only has 3.0 MG of clearwell volume.

Creation of High Pressure Zones in four locations to provide adequate water pressure and fire protection will significantly increase the City's level of service to its customers. The first project has been constructed and includes the Mountain Road Booster Pump Station and Ground Storage Tank off Hughes Drive.

The High-Pressure Zones include the following. The existing Mountain Road high pressure zone (includes a storage tank and a booster station), Sawnee Drive high pressure zone (includes a storage tank and a booster station), the Ashbrooke high pressure zone (includes only a booster pump station), and the proposed Smithdale Heights high pressure zone which is currently under design (will include a storage tank and a booster station).

Interconnections with Adjacent Municipalities is a goal of the MNGWPD. The City has been active in adding or improving interconnections with Forsyth County (to the benefit of both municipalities). Recent improvements include Castleberry Road and Kelly Mill at Bethelview Road as part of road widening projects, and Hammonds Crossing (Highway 369 and 306) and Pilgrim Mill Road improvements.

The following table summary shows anticipated capital improvement projects over the next five years as recommended for the city's water system.

Table 1 - Water Capital Improvement Plan

ITEM	DESCRIPTION	CONSTRUCTION AMOUNT	PRIORITY
1	Greenwood Acres Drive Water Line Replacement	$7,023,375.00	2023
2	Highway 20 Water and Sewer Improvements Phase I	$22,492,350.00	2023
3	Highway 20 Water and Sewer Improvements Phase II	$6,489,975.00	2023
4	Highway 9 Water Line Replacement	$9,509,280.00	2023
5	Lake Lanier Water Storage Contract	$7,500,000.00	2022
6	2023 PWPF Improvements (36 MGD)	$22,500,000.00	2023
7	Sawnee Drive 36-inch Water Main	$10,000,000.00	2023
8	Bethelview Road 1.5 MG Water Storage Tank	$6,000,000.00	2023
		$91,514,980.00	

SECTION I
Introduction

Planning Objectives, Regulations & Stakeholders

In 2001, the Georgia General Assembly created the Metropolitan North Georgia Water Planning District (District) as one of 12 regional districts in the state to support implementation of Georgia's Statewide Water Management Plan. Under state law the MNGWPD created three regional plans beginning in 2003 to preserve and protect water resources within the region: The Water Supply and Water Conservation Management Plan, the Wastewater Management Plan, and the Watershed Management Plan.

The District oversees a 15-county region, including Forsyth and the City of Cumming. The district plans provide policy guidance for protection of the limited water resources within the Chattahoochee and Coosa River Basins, as well as the wider reaching Flint, Ocmulgee, Oconee and Tallapoosa basins. Regional planning supports a broader view for the entire area with an integrated approach for the accompanying local master plans. The 2009 District plan revisions reflected more comprehensive approaches in system planning.

The City's Water Master Plan in 2012 added future water system demands, decommissioning of outdated facilities, and future land use projections as a stronger basis for sizing system components. The City of Cumming's Water Master Plan update for 2022 coincides with the most current 2009 regional planning and amendments under the District's Plans.

Since 2003, the City of Cumming has updated their master plans in 2007, 2012, 2017 and current year 2022. The plan objectives support continued compliance for anticipated regulatory requirements, revise forecasted population growth, and improvements to system reliability and redundancy. This 2022 update includes results from a current evaluation of the city's water system, revised water model calibrations and recommendations to address design, construction, and financing for the system. The planning period is now extended to year 2040, and revisions made at the interim period of 2030 to identify transitional areas. The water Capital Improvement Plan (CIP) has been streamlined in a more concise spreadsheet and placed in the executive summary for easier reference. The new CIP outlines financing and project phasing for advancing this water master plan in the immediate plan years of 2022-2021.

Included from the review process is a revised master planning map for the entire service area with location of existing and future system facilities, related county facilities, design information (capacity, flow, head) and major network distribution lines. Also, shown on the map are expected system expansion and decommissioning of any facilities as system demands change into plan year 2040. A full-sized copy of the plan map is included in a back sleeve of this report.

Key stakeholders in the planning process include the city's residents, area developers and end users of the system, particularly Forsyth County as a larger user. Cumming Utilities provides high quality potable water to more than 22,000 residential customers, businesses, and industrial water users, as well as emergency water service for fire flows and Northside Forsyth Hospital. Regulatory agency interaction includes Georgia EPD, The Metro District and regional planning organizations such as the Atlanta Regional Commission and the North Georgia Mountains Commission.

Planning Background

The City of Cumming's Potable Water Production Facility (PWPF) was originally constructed in 1969 and has expanded treatment capacity and production as growth demand required. Currently the facility has filtration capacity up to 24.0 MGD (monthly average) as permitted by the Georgia EPD and the Raw Water Intake Facility at Lake Lanier can supply up to 105 MGD of raw water for production.

The City of Cumming's existing **surface water withdrawal permit WSID CS1170000 (Permit No. 0598-1290-07 modified June 8, 2018)** contains a special condition mandating shared raw water withdrawal from Lake Lanier as Forsyth County has two pumps which currently draw surface water through the city's RWIF. This permit and the potable water production facility **operation permit (GAG640033)** are included in Appendix E.

Total permitted raw water withdrawals for Cumming is currently 30.00 MGD maximum 24-hour daily withdrawal, 23.82 MGD monthly average, and an annual average of 12.82 MGD.

There are formal service delivery agreements between the City of Cumming and Forsyth County. The original 1987 agreement for Cumming Utilities sewer boundary is still current with no changes expected through 2040. The City and County executed an agreement in October of 2012 for a new Raw and Finished Water Agreement executable from November 1, 2012, through October 31, 2022, with a renewal option through 2032 and again in October 2042. This new service agreement specifies pricing as well as defining the current Water and Sewer Service area boundary.

Part of the city's service delivery strategy with Forsyth County is to deliver not less than 400 MG of finished water annually, provided the County demand on any particular day does not result in an EPD permit violation. The City has full responsibility for operation and maintenance of the City's Intake Facility and other components of the transmission main.

SECTION II
Local Planning Policies

Design Criteria Codes and Regulations

Requests for water service at elevations exceeding 1,280 feet above MSL shall be the responsibility of the person requesting to provide a licensed engineering design and construction of pump systems and storage that will also meet fire flow requirements for the City's system.

Service Area and Utility Agreements

The City of Cumming faces many challenges for providing potable water service because of a rapidly growing and changing population, a diverse topography and managing and conserving water resources. Figure 1 shows the City's current service area. As communities in the area become more interlaced and overlapped than in previous history, increasing collaboration will be required for sharing of environmental features and resources.

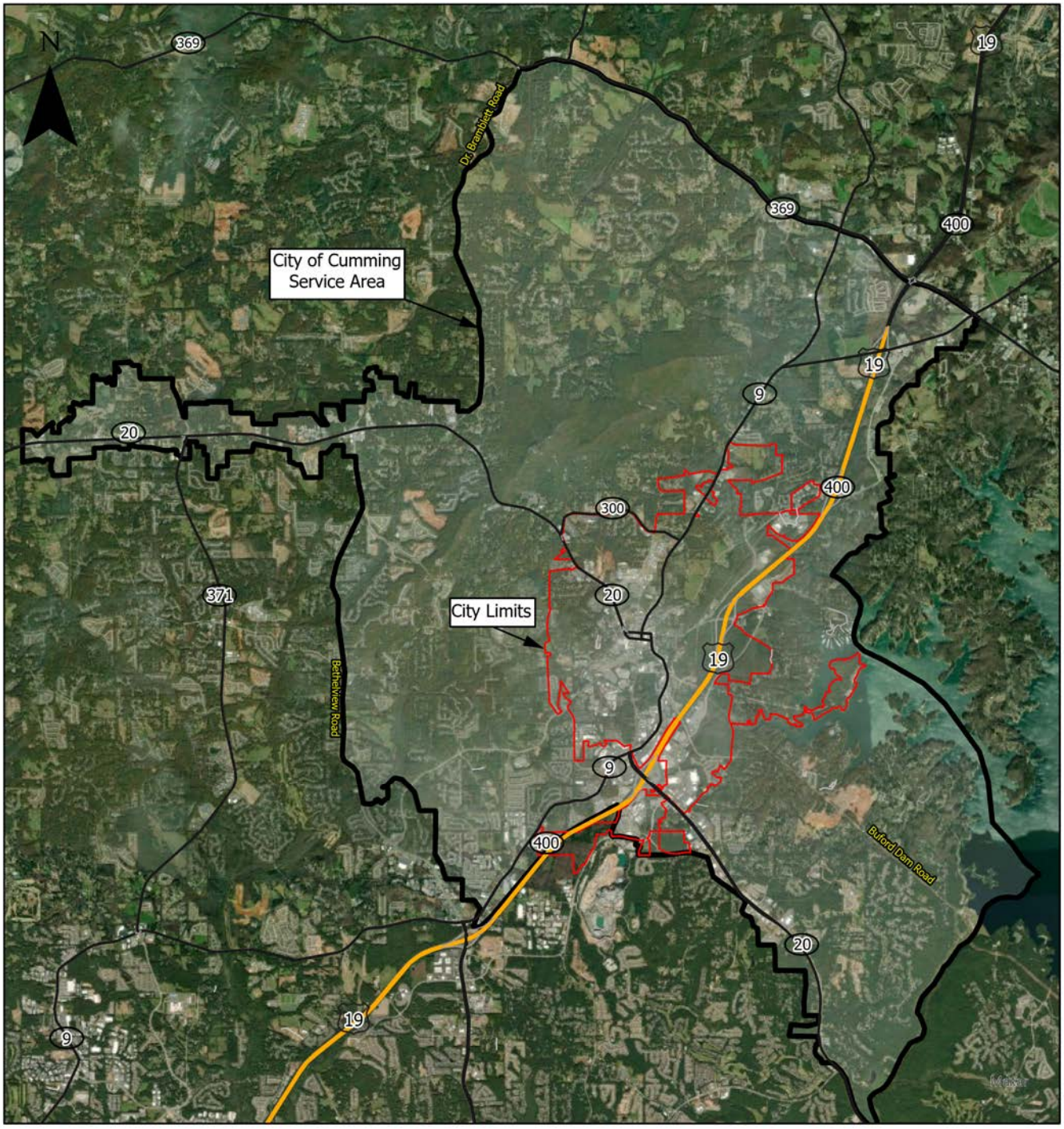
While the city's service area has expanded well beyond the city limits, this growth and trend are expected to continue. Proximity to Lake Lanier coupled with major travel routes through the city will continue to be strong drivers of increased population as well as higher employment from new businesses and industries to the area. Developments such as employment centers and communities with higher density along the major travel corridors will require added capacity and networks of infrastructure to support that growth.

Key infrastructure that includes reliable water and wastewater treatment capabilities, transportation, and modern communications infrastructure systems will be needed. With Lake Lanier as the largest body of water in Georgia, and the sole source of raw water for the region, population forecasts were analyzed with a broader perspective and increased attention to conserving water to support the expected demands which will be placed on the city's water system.

Figure 1 shows the boundary of the city's service area. This also includes the west Highway 20 corridor which extends to the Cherokee County line. A local Service Delivery Strategy exists between Forsyth County and The City for integrated utilities and services to avoid duplication. Specific areas of service for water occur in 6 key areas. The complete Service Delivery Strategy is under Appendix D.

1. ***Hwy 20 east of Cumming*** **–** The City serves any parcel that has access to Highway 20 through the corridor to Gwinnett County along the south side and all parcels north.
2. ***Hwy 20 west of Cumming*** **–** The City serves any parcel that has access to Highway 20 through the corridor to Cherokee County along the north and south sides. The City serves the intersections of Doc Sams Rd., Franklin Gold Mine, Friendship Cir, Spot Rd., and Spot Rd. Connector. The County can develop any other locations/intersections north or south and must use Heardsville Rd. route.
3. ***Bethelview Rd*** **–** The City may serve any intersection along the east side and north of Castleberry Road.
4. ***Doc Bramblett & Spot Rd*** – The City will serve east side of Doc Bramblett and any intersections along the east side. County may install a water main(s) to Hwy 369, and then SE along Hwy 369 up to Hwy 9.
5. ***Hwy 369 & Ga. 400*** **–** The County may continue its water main eastward along Hwy 369 from this intersection up to Six Mile Creek. The City will serve all customers from Doc Bramblett Road to Hammonds Crossing (Highway 306) on the south side of 369.
6. The City also serves development west and north of Six Mile Creek and areas south of Hwy 369.

Figure 1 - City of Cumming Service Area



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Cumming Utilities
Water and Sanitary Sewer Service Area
City of Cumming

CUMMING UTILITIES

Raw Water Resources

The City of Cumming and the extended service area customers rely on Lake Lanier as the sole source of raw water for the region and entrust the Corps of Engineers continued operation of the reservoir. Consistent with the District's regional plans, the City assumes the federal reservoir(s) will continue to operate in meeting water supply needs within the basin, and operate consistent with Georgia EPD guidance. Recent upgrades to the city's intake facilities, specifically raw water intake facility III, now allows raw water withdrawals from a lower elevation than previously. While Forsyth County and surrounding communities have considered building new reservoirs in the Etowah River Basin, the City of Cumming's current intake and raw water infrastructure is sized to accommodate City needs as well as all of Forsyth County through plan year 2040.

As the supply of raw water from Lake Lanier becomes strained during dryer periods, the City recognizes the need for increased water conservation. The City has implemented measures recommended by the district including a tiered rate structure, rebates for high-efficiency toilets and educational programs, to support conservation among their customers.

Water Source Protection

The protection of source water (drinking water supply) and the watersheds that flow to them is vitally important to the City of Cumming and its customers since all their public drinking water supply comes from the surface waters of Lake Lanier. Water quality and degradation of these surface waters increases treatment costs and can potentially pose human health threats.

In 2000, the city created a water source protection program to support protection of the City's drinking water source. This program includes stream buffer protections, comprehensive land use planning to minimize higher risk land use types near Lake Lanier, illicit discharge detection measures, and local education programs.

Additionally, a portion of the City's Service Area is within the watershed(s) that feed Lake Lanier as a source water supply and coordinating with local jurisdictions for source water supply protection issues and develop/implement interjurisdictional agreements as necessary. Many of these items were executed through the City's ordinances by regulation of new development.

Water Conservation

The Georgia Water Stewardship Act (GWSA) of 2010 required all water systems serving populations of over 3,300 to conduct annual water system audits and implement a water loss detection program. The water audit provides measurable benchmarks for locating water losses and addressing inefficiencies within the distribution system. The City of Cumming now utilizes the AWWA Free Water Audit Software and has completed water audits annually since the last master plan update in 2017. The current reporting year 2021 water audit report is included in Appendix F. The 2021 audit was Tier IV validated receiving a certified data validity score of 72 and a certified infrastructure leakage index of 2.2.

Many of the Districts recommendations for conservation measures have been implemented by the City. A website was completed in 2016, which was crucial for increasing public education and communication to the city's customers as key partners in protecting and conserving available water in the region. The new website allows real time information easily available to the public and the city's customers for water conservation and contacting utility personnel for leaks or urgent system issues.

Of the 10 water conservation measures identified by the District Water Plan as well as measures specified in the June 2015 plan amendment, the City has implemented the following measures.

- Tiered conservation pricing
- Replacement of older, inefficient plumbing fixtures (toilet rebate program)
- Reduction of water system leakage through regular water audits

Additionally, the city also promotes proper maintenance of septic systems and has a strong IDDE program for illicit discharges. Current ordinances and codes provide penalty for illegal discharges to the city's storm sewer system which can impact environmentally sensitive streams. The City has been committed to improving water losses in their system including locating illegal connections to the city's water system.

The 10 water conservation District measures from the regional plan are:

1. Tiered Conservation pricing
2. Replace older, inefficient plumbing fixtures
3. Pre-rinse spray valve retrofit education program
4. Rain sensor shut-off switches on new irrigation systems
5. Sub-meters in new multi-family buildings
6. Assess and reduce water system leakage
7. Conduct residential water audits
8. Distribute low-flow retrofit kits to residential users
9. Conduct commercial water audits
10. Implement education and public awareness plan
11. Install 1.28 gpf toilets and low flow urinals in government buildings
12. Require new car washes to recycle water.

3 of the 10 measures strengthened in amendment

1a) Irrigation meter pricing at 200 percent of the first-tier rate
2a) 1.28 gpf toilet rebate program only by 2014
10a) Minimum local education requirements

The City of Cumming's existing surface water withdrawal permit (#0598-1290-07 modified in 2018) contains a special condition mandating shared raw water withdrawals between the City and Forsyth County from the City's intake structures on Lake Lanier. Cumming Utilities sells a portion of raw water withdrawn from Lake Lanier to Forsyth County for their Water Treatment Facility. Forsyth County, in turn, also sells some of this raw water to the Etowah Water and Sewer Authority.

There are formal service delivery agreements between the City of Cumming and Forsyth County. The original 1987 agreement for Cumming's water and sewer service area is still current. The City also signed a revised Raw and Finished Water Agreement in October 2012 executable from November 1, 2012 through October 31, 2022, with renewal options in 2032 and again in October 2042. The City's current service delivery strategy is provided in

Appendix D, showing the service area boundary and details of agreed upon water purchases and sales between the two municipalities.

Part of the City's agreements with Forsyth County is to deliver not less than 400 MG of finished water annually to the County provided the demand does not result in an EPD permit violation.

The agreement also specifies the county purchase raw water amounts of 3.5 MGD monthly maximum basis and 4.1 MGD daily maximum. The County retains an option to purchase additional raw water if available, rather than purchase finished water above the required annual 400 MG.

The City has sole responsibility for operation and maintenance of the City's Raw Water Intake Facility (RWIF).

The following sections describe the City's water conservation plan as required by Senate Bill 10, rules effective on December 29, 1994, and as amended pre-391-3-6-.07. This Water Conservation Plan is officially adopted by the City of Cumming as part of their Water Master Plan and has been updated per MNGWPD's requirements.

System Management

Effective water loss control is an important part of Cumming Utilities' commitment to meet regulatory standards and provide efficient management of their water system. It also supports water reliability in meeting the challenges of increased water costs and water scarcity. Water audits track all sources and uses of water within the City's water system by evaluating the quality and efficiency of operations. Water losses are generally the total treated water supplied to the distribution system less the amounts consumed and/or authorized consumption as expressed as a percentage of the total treated water supplied. The equation is:

$$\frac{\text{(Potable Water Supplied to Distribution-Authorized Consumption Billings)}}{\text{Potable Water Supplied to Distribution}}$$

The International Water Association/ American Water Works Association (IWA/AWWA) further define the water losses as apparent losses and real losses. Apparent losses are comprised of illegal water use, metering inaccuracies, and billing errors, while real losses are those associated with actual leaks in the distribution system. The City has submitted annual water audits to the State since 2011. These audits provide benchmarks and areas for improvement as the quality of data improves. Copies of Cumming Utilities most recently submitted audits are included in Appendix F (certified years 2011-2021).

From the 2021 certified audit, distribution losses were:

(2747.915 MG – 2171.801 MG) / 3200.638 MG = 20.97%

The District's goal is to lower water losses below 10% by plan year 2035. However, recent District plan amendments have accelerated this goal for those municipalities currently exceeding the 10%. The City is targeting further reductions from the current 20.97% to 17.84% by plan year 2025, in order to meet the required 10% by plan year 2035.

As the City continues implementation of their conservation plans and utilizing the water audits and hydraulic modeling of the system, losses are expected to continue to decline. Several key areas of focus recently are volume from own sources, customer retail unit costs (apparent losses), and variable production costs (real losses). Figure 2 indicates water losses since 2005 for the City's water system and projected future target reductions in accordance with the District's conservation plans.

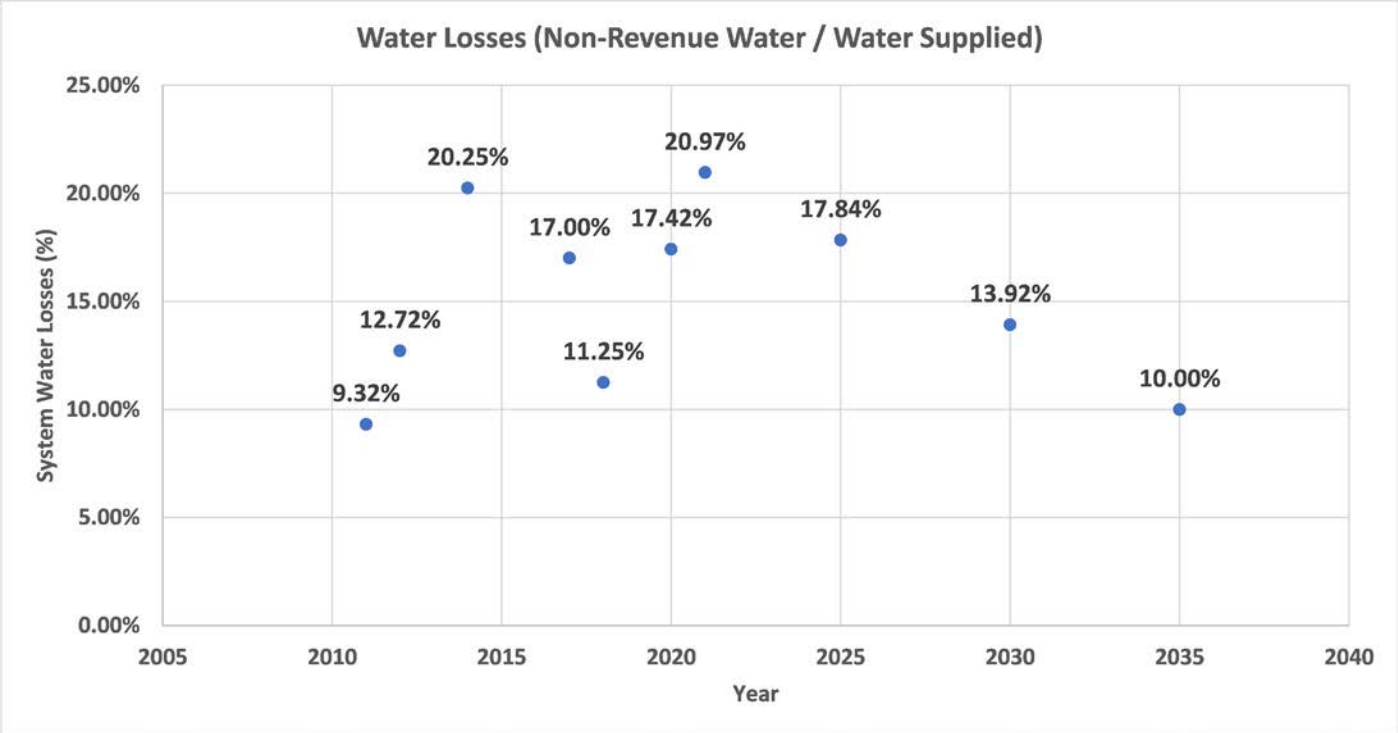


Figure 2 - Water Losses

Since the original 2005 Water Conservation Plan, the City has improved flow measurements for both potable water and raw water at their Potable Water Production Facility (PWPF). A new 24-inch venturi meter was installed on the high service line leaving the plant to accurately measure flows pumped into the distribution system that runs along Highway 9. Previously, flows from two high service pumps were estimated using computer approximations.

Another flow measuring device recently installed includes a Parshall flume to record centrate flows leaving the PWPF settled solids facility. These flows return to Lake Lanier via Sawnee Creek and support recharge basin levels for the Chattahoochee River Basin. Measuring these flows also assists in targeting losses within the City's water system.

All drinking water leaving the PWPF is now measured through one of two venturi meters. With the Parshall flume measuring centrate from the sludge dewatering facility and an overflow Parshall flume measuring excess water pumped to the PWPF, all water to and from the facility is accurately recorded.

Programs to Reduce Water Losses

The City is continually working to improve programs to identify and reduce their water system's real water losses from system leakage, and apparent water losses from illegal water use, billing and metering errors. There are currently over 22,000 customer meters within the distribution system.

In addition to the system management improvements described above, the following ongoing programs, plans and regulations reduce water losses and improve reliability of the city's water system.

1. ***Leak Detection –*** The priority and primary function of the Distribution and Collection Division is to maintain the system by repairing water system leaks. Distribution leaks are identified by distribution crew personnel, water construction inspectors, utility meter readers, and as reported by customers.
2. ***Water Mapping –*** The City has accurate up-to-date water maps and a hydraulic model of their water distribution system. These maps have been incorporated into the City's GIS allowing modification and updates to the master plans during interim plan years. Map information includes line size, valve and hydrant locations, water line locations, and interconnections with Forsyth County. Design data in the hydraulic water model includes pressures and flow analysis. The City of Cumming Department of Utilities publishes the master maps online at www.cummingutilities.com.
3. ***Metering, Maintenance, Testing and Replacement –*** Since 1998, the City has implemented a testing and calibration program. All meters 3-inches and larger, wholesale and retail meters, are tested, repaired, and calibrated annually. The program also evaluates the meters to ensure the proper meter type is matched to the kind of flows it measures (significantly low flow conditions justify the cost of a compound meter which can more accurately measure low AND high flow conditions). An added goal of the program is to provide calibration to specified accuracy limits. Meter accuracy improves the quality of data used to audit and reduce losses within the system.

   For small meters less than 3-inches, the City also implements a change out program which targets an annual 10% replacement of the system's customer meters. This equates to replacement/rebuild every 10 years. The City began converting all old meters to radio frequency based AMR (Automatic Meter Read "AMR" type meters) starting in 2002. Currently all meters have been updated to AMR and the City is now beginning conversion to AMI (smart meters) which adds data collection of up to 3 months and technology for 2-way communication. AMI meters allow increased billing accuracy, leak detection, reverse flow alarm, rate of use and time of use. It also provides customers with more "real-time" consumption data to better manage their water use. Approximately 30% of the meters have now been converted to AMI.

   Because of the challenging topography across the City service area, SCADA and/or tower transmission of data is not feasible or cost effective. With current AMR meters, city field personnel can capture all customer data (drive by) within a 4-day cycle.
4. ***Prevention of Tank Overflows –*** All tanks have level indicators which are telemetered to the PWPF for monitoring and recording. High service pumping requirements are determined from monitoring of the tank levels. All tanks are equipped with altitude valves to prevent tank overflows.
5. ***Flushing Program –*** Because of the high demand in the system, there are no areas that require routine flushing to maintain water quality. Lines are flushed only when breaks are repaired and when new lines are placed into service. The water line for Tyson's poultry processing plant does require regular flushing to minimize rust problems for the old, unlined cast iron pipe.
6. ***Prevention of Unauthorized Water Users –*** The City has an active permit system in place for all water use that is not recorded by a permanently installed meter. The City provides hydrant meters for contractors and other customers requiring large quantities of water for road cleanup, water trucks, and similar activities. The City and County law enforcement agencies as well as other utility departments with regular field operations are consistent in reporting violators discovered without a permit and report them promptly to the office of Water Distribution. The City now provides separate metering on fire hydrants.
7. ***Un-metered Connections –*** There are no known un-metered service connections.

System Interconnections

There are 16 master meters within the City's service area of which fourteen record sales of finished water to Forsyth County and one of which the City repurchases water from the County. Master meter records are maintained and kept on site at the Water Distribution and City Hall. Starting from the beginning of the year 2023, City of Cumming will not purchase water Forsyth County.

Master Meters for Exporting Finished water to Forsyth County

1. 12045 Pendley Rd (single Feed, Inactive)
2. Kelly Mill & Bethelview (dual feed)
3. Hyde Rd (single feed)
4. Doc Sams & Heardsville Rd (single Feed, Inactive)
5. Canton Hwy & Bethleview (single feed)
6. Bonnie Brae Rd (single feed)
7. Cambridge Hills Dr (single feed)
8. Geneva Woods (single feed)
9. Old Atlanta Rd (single feed)
10. Doc Bramblett (single feed)
11. Pilgrim Mill (dual feed)
12. Castleberry (single feed)
13. Doc Bramblett @ 369 (dual feed)
14. Hammonds Crossing (dual feed)

Master Meters for Importing Finished water from Forsyth County

1. Doc Bramblett @ 369 (dual feed)
2. Old Atlanta Rd (dual feed)

Emergency Connection Meter between City and County

1. SR 9 & Mountain Rd, from the County's 36" line to the City's 16" line
2. Northside Hospital, from the County's 36" line to the City's 36" line

The City of Cumming is not directly connected with any system other than Forsyth County. The City has a wholesale purchase agreement with Forsyth County to supply drinking water. Forsyth County is also connected to Fulton County's water system at three metered locations.

Treatment Plant Management

A. Meter Calibration

The Potable Water Production Facility uses several large flow meters for intake and distribution water within the system. The locations of the meters are shown in the attached process flow diagram in Appendix J. Meter accuracy testing and/or electronic calibration for water treatment plant is conducted annually. Testing includes water treatment plant meters for raw, finished water, and all other in-plant use water. Meter testing and recalibration records are maintained by the City's Water Production Division Superintendent and available on-site at the PWPF. Small flow meters that do not pass the test are removed and replaced. All documentation recording these activities is maintained and kept on-site at the PWPF by the City's Water Production Division Superintendent.

The AWWA Water Audit literature addresses the issue of metering. Accurate metering is important to the accuracy of the Water Audit. The three components of the metering are:

1. Flowmeter
2. Differential Transmitter
3. Communications between DP transmitter and the SCADA.

1. Flowmeter

The flowmeters that Cumming uses are BIF venturi meters supplied by Jerry Wills, Principle Environmental. Per the manufacturer, the meters are 0.5% accurate as manufactured. As the meters are measuring finished water with little abrasion, no change in accuracy is expected over a long period of time.

The meter itself does not need to be tested based on the fact that the meters are 0.5% accurate as manufactured.

2. Differential Transmitter

The venturi flowmeter has a differential pressure and flow relationship. The differential pressure across the meter is measured by a differential pressure transmitter. The differential pressure is converted to a flow value and that flow value is transmitted to SCADA.

Cumming has the AquaSummit calibrate the differential pressure transmitters twice a year. The procedures followed are industry standard.

3. Communications between DP transmitter and the SCADA

The communications between DP transmitter and the SCADA should be checked.

B. In-Plant Water Use

The City's in-plant water usage includes losses within the treatment plant and was 7.08% for 2021, which is a reduction. In-plant water uses and losses are expected to decline as plant improvements are completed and expansion plans for the PWPF include updating older equipment and processes. In-plant water uses are shown in Table 2.

Table 2 - Annual Water Consumption and In-Plant Water Use

RAW WATER		FINISHED WATER	
CITY Of CUMMING		CITY Of CUMMING	
Month	Monthly Demand (MG) (measured flow)	Monthly Distribution at 2 master meters (MG) (measured flow)	In-Plant Water Use Ratio
Jan 2020	221.399	206.290	6.82%
Feb 2020	193.440	178.760	7.59%
Mar 2020	210.038	193.921	7.67%
Apr 2020	227.811	212.387	6.77%
May 2020	250.778	232.638	7.23%
Jun 2020	299.546	280.942	6.21%
Jul 2020	388.791	357.940	7.94%
Aug 2020	360.008	322.585	10.40%
Sep 2020	256.274	227.781	11.12%
Oct 2020	258.745	228.024	11.87%
Nov 2020	237.472	210.705	11.27%
Dec 2020	241.749	215.271	10.95%
Jan 2021	239.045	215.146	10.00%
Feb 2021	263.956	249.336	5.54%
Mar 2021	259.912	243.634	6.26%
Apr 2021	277.485	253.799	8.54%
May 2021	301.867	276.108	8.53%
Jun 2021	285.860	266.464	6.79%
Jul 2021	326.801	305.307	6.58%
Aug 2021	353.015	328.915	6.83%
Sep 2021	281.202	264.984	5.77%
Oct 2021	372.164	352.568	5.27%
Nov 2021	248.387	229.336	7.67%
Dec 2021	233.821	216.961	7.21%
Jan 2022	225.050	207.168	7.95%
Feb 2022	188.919	172.446	8.72%
Mar 2022	205.223	182.575	11.04%
Apr 2022	210.347	190.426	9.47%
May 2022	252.611	235.998	6.58%
Jun 2022	339.211	319.195	5.90%
Jul 2022	397.719	372.955	6.23%
		Year	**Annual Avg. In-Plant Water Use**
		2020=	**8.82%**
		2021=	**7.08%**

Filter backwashing accounted for approximately 2 percent of the City's in-plant water usage, laboratory water use accounted for about 1 percent, leakage of old valves, basins and lines accounted for approximately 1 percent, and overflows accounted for approximately 3 percent. All filters including the 1969 and 1979 filters have been retrofitted with air scour backwash to minimize the amount of backwash water used during the backwash cycle. Continued operator training to improve procedures that minimize basin overflows and filter washing provide additional measures for minimizing in-plant water use.

Rate-Making Policies

Non-Billed Service Connections:
City accounts, exempt and fire line meters constitute all non-billed metered connections. With the exception of these accounts, all other service connections are billed. Annual billing reports are shown in Table 3 on the following page. As the City has worked to identify metering inaccuracies and billing errors, billings reports have been revised accordingly. Fire lines was added as a separate account item in 2010, and Irrigation as its own line item was added in 2011.

Water Rates:
Following completion of a rate study in 2022, and in accordance with District plans, the City adopted a tiered rate billing structure. The current billing schedule is included in Appendix M.

Second Meter and Irrigation Meter Policy:
The City periodically sells irrigation meters (a second meter) to those customers who wish to be exempt from sewer service charges applied to those gallons used only for irrigation. All customers who choose to have irrigation water meters are charged for the water use.

Other:
The City's water system is financially self-sustaining. The system recovers the cost of its facility by incorporating a charge for depreciation. Other accounting policies include a Capital Improvements fund, debt service reserve accounts. Water system revenues do not subsidize non-water/sewer revenues.

Table 3 - Annual Billing Reports

GALLONS OF WATER BILLED 2021											
	Residential	Irrigation	Commerical	Tyson Foods	Koch Foods	Smithfield	Forsyth County	City Accounts	Exempt	Fire Lines	Totals
January	102,576,810	623,090	20,352,130	34,175,160	2,438,660	1,259,600	12,709,610	116,005	0	70,750	174,321,815
February	94,697,170	195,750	23,510,750	33,847,910	2,306,800	1,642,270	47,313,790	1,098,520	0	82,940	204,695,900
March	90,387,630	214,430	21,598,540	36,134,510	2,382,460	1,843,070	44,256,210	2,255,680	0	85,510	199,158,040
April	91,150,990	523,130	49,802,690	11,650,900	2,365,650	1,425,040	39,111,090	1,085,040	0	81,300	197,195,830
May	117,841,870	3,585,540	-5,070	40,935,200	2,807,230	1,713,090	33,417,250	1,352,040	0	73,830	201,720,980
June	125,564,990	5,819,070	28,102,860	39,940,460	2,494,530	1,884,510	19,483,450	1,406,520	0	68,230	224,764,620
July	126,064,450	10,193,490	28,377,630	38,358,500	3,041,240	1,944,980	16,938,100	1,664,520	0	83,140	226,666,050
August	121,602,080	10,683,790	20,094,400	45,363,940	2,504,600	2,121,370	91,714,550	1,317,180	0	79,110	295,481,020
September	121,835,710	9,567,080	31,890,350	41,856,490	2,219,530	1,663,450	20,111,160	1,521,660	0	124,560	230,789,990
October	115,029,640	7,916,240	27,812,740	43,723,280	2,923,480	2,116,680	39,181,510	2,207,350	0	114,790	241,025,710
November	102,866,480	5,937,930	30,472,410	39,680,190	2,477,820	1,666,500	24,247,540	1,981,450	0	77,440	209,407,760
December	98,709,820	3,362,380	26,747,200	38,884,510	2,790,540	1,510,780	1,054,570	2,258,280	0	60,710	175,378,790
TOTALS	**1,308,327,640**	**58,621,920**	**308,756,630**	**444,551,050**	**30,752,540**	**20,791,340**	**389,538,830**	**18,264,245**	**0**	**1,002,310**	**2,580,606,505**

TOTAL WATER CUSTOMERS BEING BILLED 2021										
	"Residential Inside"	"Residential Outside"	"Irrigation Inside"	"Irrigation Outside"	"Commercial Inside"	"Commercial Outside"	Forsyth	"Fire Line"	"No Charge"	Total
January	1,966	17,919	124	232	672	489	27	184	87	21,700
February	1,977	17,966	122	232	672	490	27	184	87	21,757
March	1,989	18,058	122	234	674	490	27	184	90	21,868
April	2,007	18,079	122	236	669	490	27	184	91	21,905
May	2,029	18,126	124	237	673	490	27	189	93	21,988
June	2,029	18,197	124	240	677	490	27	188	96	22,068
July	2,053	18,189	126	239	676	490	27	188	96	22,084
August	2,070	18,259	125	239	676	490	27	188	96	22,170
September	2,073	18,254	127	241	670	491	27	188	96	22,167
October	2,069	18,223	125	241	677	490	27	188	96	22,136
November	2,096	18,345	125	242	677	490	27	188	96	22,286
December	2,084	18,361	125	241	673	492	27	188	96	22,287

Plumbing Ordinances and Codes
The City presently enforces the Water Conservation Ordinance and the Georgia State Minimum Standard Plumbing Code through reference and adoption of specific codes to the City of Cumming.

The City has currently adopted ordinances under Chapter 103 Building and Building Regulations that require the use of ultra-low flow plumbing fixtures. The most recent codification is located online at https://www.municode.com/library/ga/cumming/codes/code_of_ordinances?nodeId=14835

On February 8, 2014, the City adopted an ordinance to support a water waste policy, specifically Chapter 111, article III, Sec. 111-73. – Standards for outdoor watering of landscape and potable water waste.

Recycling
There are no opportunities for the reuse of treated wastewater or the reuse of cooling water. Treated effluent from the City's Advanced Water Reclamation Facility is returned to the Chattahoochee River via Big Creek. Tyson poultry processing operations are a significant City water user and employ up-to-date water conservation methods.

Educational Programs
The City of Cumming regularly conducts tours of their PWPF and advanced water reclamation facility for school and civic groups and have done so for years. Also, programs are presented to school children at school lending to public awareness of the importance of water conservation. The water conservation and education information can also be found on city's website.

Progress Reports
The City has worked to comply with the requirements of the Metropolitan North Georgia Water Planning District's Water Supply and Water Conservation Management Plan and has made progress reports to the EPD as required by the MNGWPD. The most recent MNGWPD audit was submitted in April 2021.

Water Use Data
Water Audit data and Water Loss Control Program for 2021 are provided under Appendix F.

Long Range Planning
Table 4 presents water system demand projections for Cumming Utilities including raw water sold to Forsyth County.

Table 4 - Projected Water Demand for City of Cumming Service Area

Demand Categories as Historical Avg. Percent of Total Sales						
Year	**Residential**	**Commercial**	**Tyson/ Industrial**	**Forsyth**	**City/ Exempt**	**Irrigation**
(1994-2004 Sales Data)	31.25%	8.82%	14.68%	44.49%	0.76%	
(2005-2011 Sales Data)	31.55%	8.75%	12.69%	46.36%	0.65%	
(2012-2021 Sales Data)	46.31%	11.74%	19.12%	19.63%	1.07%	2.13%

	Commercial/Residential Ratio (C/R)=25.35%	(Commercial % sales/Residential % sales)
	Exempt/Residential Ratio (E/R)=2.32%	(Exempt % sales/Residential % sales)
	Irrigation/Residential Ratio (C/R)=4.60%	(Irrigation % sales/Residential % sales)

Residential Use*	**101**	**gpcd**	Average from 2014-2018 is 101 gpcd. Forsyth County is 106 gpcd from 2017 MNGWPD Report

*MNGWPD Water Withdrawals Per Capita Remain Steady

https://northgeorgiawater.org/current-water-stats/water-withdrawals-per-capita-remain-steady/

Projected Finished Water Annual Average Daily Demand for City of Cumming Service Area								
Year	**Cumming Service Area Population (3)**	**Residential Demand**	**Commercial Demand**	**Tyson's-Industrial Demand (1)**	**Forsyth County per 2012 contract**	**City-Fire-Exempt Demand**	**Irrigation**	**Annual Average Daily Demand "AADD"**
	(2022 calcs)	(MGD)	(MGD)	(MGD)	(MGD)	(MGD)	MGD	(MGD)
2010	45,191	4.56	1.16	1.33	4.40	0.11	0.00	11.56
2015	52,413	5.29	1.34	1.26	0.91	0.12	0.24	9.17
2020	55,132	5.57	1.41	1.38	0.86	0.13	0.26	9.60
2021	61,929	6.25	1.59	1.36	1.39	0.15	0.29	11.02
2022	64,197	6.48	1.64	1.37	1.19	0.15	0.30	11.14
2025	71,350	7.21	1.83	1.41	1.19	0.17	0.33	12.14
2030	90,367	9.13	2.31	1.49	1.19	0.21	0.42	14.75
2033	93,428	9.44	2.39	1.53	1.19	0.22	0.43	15.21
2035	99,737	10.07	2.55	1.56	1.19	0.23	0.46	16.08
2040	115,246	11.64	2.95	1.64	1.19	0.27	0.54	18.23
2050	156,150	15.77	4.00	1.81	1.19	0.37	0.73	23.87
2060	217,024	21.92	5.56	2.00	1.19	0.51	1.01	32.19

1 Assumes 1% annual increase from base year 2021, limited to 2.1 mgd by available land for development

2 Calculated from actual billing data

3 SOURCE; Interpolated Population by linear extrapolation on OPB Medium forecasts

Use average daily demand from 2017 to 2021 for Forsyth County Purchased Water Demand

Projected Finished Water Demand (Maximum Monthly Demand and Maximum Day Demand)											
Year	**2015**	**2020**	**2021**	**2022**	**2025**	**2030**	**2033**	**2035**	**2040**	**2050**	**2060**
Cumming Service Area Population	52,413	55,132	61,929	64,197	71,350	90,367	93,428	99,737	115,246	156,150	217,024
City Residential	5.29	5.57	6.25	6.48	7.21	9.13	9.44	10.07	11.64	15.77	21.92
City Commercial	1.34	1.41	1.59	1.64	1.83	2.31	2.39	2.55	2.95	4.00	5.56
City Industrial	1.26	1.38	1.36	1.37	1.41	1.49	1.53	1.56	1.64	1.81	2.00
Forsyth County	0.91	0.86	1.39	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
City Accts / Exempt	0.12	0.13	0.15	0.15	0.17	0.21	0.22	0.23	0.27	0.37	0.51
Irrigation	0.24	0.26	0.29	0.30	0.33	0.42	0.43	0.46	0.54	0.73	1.01
Annual Average Daily Demand (AADD)	9.17	9.60	11.02	11.14	12.14	14.75	**15.21**	16.08	18.23	23.87	32.19
Max Month Daily Demand (MMDD)	17.11	17.62	21.45	21.04	22.60	26.67	**27.38**	28.74	32.09	40.88	53.85
Max Day Demand (MDD)	21.89	22.55	27.46	26.93	28.92	34.13	**35.04**	36.78	41.07	52.31	68.91

The Water Production Division (WPD) Superintendent reports the annual system loss percentages to the Georgia EPD each February for the preceding calendar year. The Superintendent also maintains records of all PWPF flow meters in his office at the facility. The office of the Director of Utilities maintains all other system planning and extension information, including the following:

- Capital needs for the system including raw water intake, elevated storage, and water transmission lines
- Updated and revised 30-year water demand projections
- Historic water demands including per-customer consumption data
- Results of all large and small meter testing, calibration and status of the meter and backflow change-out program
- Water conservation educational programs, plans and implementation
- Records associated with the implementation of the MNGWPD Water Supply and Water Conservation Management Plan and other related District Plans.

Additional Water Conservation Measures

The City of Cumming is continually striving to improve its efficiencies, increase conservation, and reduce water losses. The one-percent improvement in unaccounted for water represents a real gain for a system the size of Cumming's.

The City has stringent testing requirements for all new water main installations to minimize leakages. The City also has a program to replace existing water mains that currently leak.

Current District surveys for implementation of their water conservation plans have been included in Appendix G showing the City's ongoing work for plan compliance.

Climate Resiliency

In this section, the master plan discusses infrastructure potential and vulnerability to extreme weather events and identifies adaptive strategies for mitigating impacts both short and long term. Planning for climate resiliency includes providing infrastructure systems designed and constructed to withstand changing conditions and shocks, including changes in climate, while continuing to provide essential services.

Examples of changes in climate include natural events such as:

- Drought
- Flooding
- Tornados
- Changes in wind loading

The result of natural events may create a dependency hazard which includes interruptions of power, supplies, or utility service to the community. Beyond designing facilities to meet the EPA Design Criteria for Mechanical, Electric, and Fluid System Component Reliability along with meeting the guidelines included in the 10-States Standards and/or local design standards for water distribution, storage, and water treatment systems the following is recommended.

Consider use of solar panels for power generation. Prioritize natural and green infrastructure solutions to enhance and protect natural resources. Preserve and restore ecological systems and incorporate landscaping and/or tree planting with construction projects.

- Identify opportunities to prepare for climate change in all planning decisions. This includes operation-based training and response drills and activities that simulate flood events, tornadoes and extreme weather conditions.
- Base all planning, policy, and investment decisions on the best-available information, including local and traditional knowledge, including consideration of future climate conditions to 2040.
- Prioritize construction and maintenance projects to increase reliability of system components. For example, update stand-by power systems or diesel driven pumps, installation of bolt down manhole covers to prevent sewer overflows, and procurement of standby equipment.
- Update communication technology. Cumming is moving away from radio based SCADA to digital system for increased reliability.
- Maintain and update annually the existing Incident Command Role Summary Table to coordinate response between multiple agencies in event of an emergency.
- Maintain and annually update media contacts for local news and radio stations to communicate alerts.

Drought Contingency & Emergency Water Management

Drought management ensures contingency plans are in place to meet critical water needs for the area and reduce vulnerability of the water system to unplanned events. Emergency response plans also provide a readily available action plan which should unforeseen incidences occur and can reduce critical reaction time. The goal of this plan is to cause a reduction in water demand and use in response to drought or emergency conditions for preservation of water availability. This plan has been prepared in advance considering conditions that will initiate and terminate water preservation. Vulnerability assessments are required under the EPA's Public Health Security and Bioterrorism Preparedness and Response Act of 2002.

A Risk and Resilience Assessment and an Emergency Response Plan are required by EPA for community water systems (CWS) that serve more than 3,300 people. America's Water Infrastructure Act (AWIA) was signed into law on October 23, 2018. AWIA Section 2013 amends the Safe Drinking Water Act (SDWA). The purpose is to protect drinking water and improve cybersecurity. City of Cumming developed a Risk and Resilience Assessment in December 2020, followed by an Emergency Response Plan in June 2021.

Community water systems serving more than 3,300 persons were required to complete a vulnerability assessment on all components of the system (surface water intake treatment plant, storage tank(s), pumps, distribution system and other important related system components). The Drought Contingency and Emergency Water Management Plan provides an update in accordance with the city's Water Master Plan, including a vulnerability assessment for the system and an emergency response plan that outlines specific response measures in the event of an incident. This update serves as part of the city's planning to implement policies and procedures for increased water system security and reliability.

The Director of Cumming Utilities will monitor usage patterns and public education efforts and make recommendations to city officials on future conservation efforts, demand management procedures or any changes to this plan. This plan works in conjunction with ongoing conservation programs which provide public awareness notices, bill stuffers, website notices and other methods as a constant reminder for water conservation at all times, not just during drought or emergencies. This review and evaluation are performed on a regular basis of five years as part of the city's local Water Master Plan unless conditions necessitate more frequent amendments.

The City of Cumming withdraws surface water from Lake Lanier for use as drinking water. Lake Lanier as part of the Upper Chattahoochee River Basin serves several large public water supply systems for raw surface water withdrawals in the region.

The raw water intake facility consists of two pumping stations. Station II consists of a 12-foot square wetwell with a bottom elevation of 1030.0 feet MSL with a 36-inch intake pipe 225 LF with a centerline elevation of 1033.50 feet MSL. The intake pipe riser will function for lake levels above 1042 feet MSL. The intake capacity is 48 MGD. Station III consists of a 43-foot diameter wetwell with a bottom elevation of 1017 feet MSL and a 66-inch diameter intake pipe 350 feet long with a centerline elevation of 1024.75 feet MSL. The intake capacity is 105 MGD.

The Water Production Superintendent is responsible for monitoring water supply and demand conditions monthly (or more frequently when conditions warrant) and shall determine based on this plan when conditions warrant initiation or termination of each stage of the plan. The superintendent will notify the appropriate officials at the local level when specified triggers are reached based on monitoring of monthly operating reports, water supply and storage tank levels and/or rainfall.

The triggering conditions described below assess the vulnerability of the water source under record drought conditions as well as the production, treatment, and distribution capacities of the water system. The assessment also considers customer usage based on historical data.

Pursuant to the Rules for Drought Management, Section 391-3-30-.04, Drought Indicators and Triggers, the Director of EPD monitors climatic indicators and water supply conditions to assess drought occurrence and severity, and its impact upon the ability of public water systems to provide adequate supplies of water.

Drought Condition Indicators

Lake Lanier has a normal pool water surface elevation of 1071.00 M.S.L. Seasonal draw down of approximately three feet occurs in the summer to allow for maintenance of boat docks. The water distribution supervisor is responsible for monitoring Lake Lanier levels, finished water storage and clearwell levels on a regular basis for early drought detection.

One of the earliest indicators and/or determination of drought conditions is the supervisor's monthly review of the Ga. EPD Drought Indicators Report which provides key information for Precipitation, Streamflow, Groundwater, Reservoir levels, Short term climate predictions, Soil moisture, and Water supply conditions.

The EPD report also compares current conditions to historical levels for the following:

1. Precipitation during the prior 3, 6, and 12 months;
2. Streamflow at the select United States Geological Survey gages;
3. Groundwater levels at select United States Geological Survey monitoring wells;
4. Reservoir levels at Lake Lanier, as well as Allatoona Lake, Lake Hartwell and Clarks Hill Lake

There are three levels of drought response available to the EPD Director. The response level is determined by the severity of the drought conditions and the ability of the public water system to meet demand for water and avoid a shortage of water in the impacted areas. Drought response declarations apply to EPD permitted groundwater and surface water systems.

Drought Response Level 1:
Requires permitted public water systems to conduct a public information campaign to explain drought conditions and the need to conserve water. The campaign shall include one or more of the following: newspaper advertisements, bill inserts, website homepage, social media and notices in public libraries. It should target all commercial and residential water use, not just outdoor watering. It should emphasize what customers can do and what they should do to be good stewards of our water resources.

In addition to the requirements under Drought Response Level 1,

Drought Response Level 2:
Limits outdoor watering of landscape to two days a week determined by odd and even numbered addresses. This includes maintaining ground cover, trees and shrubs. Even numbered addresses may water on Wednesday and Saturday between 4:00 p.m. and 10:00 a.m. Odd numbered addresses may water Thursday and Sunday between 4:00 p.m. and 10:00 a.m. The following outdoor water uses are prohibited: washing hard surfaces such as streets and sidewalks, water for ornamental purposes such as fountains, the use of fire hydrants except for firefighting and public safety, washing vehicles, non-commercial pressure washing and fundraising car washes. Public water systems must also select and implement four or more items from a Drought Response Strategies Menu. Examples include an intense public information campaign, restaurants restricted to serving water only upon request, street cleaning prohibited and pool cover requirements.

Drought Response Level 3 (Additional measures):
All landscape watering is prohibited when for the purpose of maintaining ground cover, trees and shrubs. Watering of personal food gardens can only be done from 4:00 p.m. to 10:00 a.m. unless using drip irrigation or soaker hoses. Other allowable water uses include hand watering between 4:00 p.m. and 10:00 a.m., watering of athletic fields or public turf grass recreation areas, watering of golf courses with some limitations, use of reclaimed wastewater subject to the rules and water use during professional installation of irrigation systems. All ten items from the Drought Response Strategies Menu must be implemented. Professional exemptions: certain business activities are exempt from the rule including commercial pressure washing, permanent car wash facilities, construction sites and the watering in of pesticides and herbicide on turf.

Under Drought Response Level 3, the City utilizes tiered conservation rates.

The following thirteen outdoor water uses also are allowed daily at any time of the day by anyone during non-drought conditions and Drought Response Level 1 and Level 2.

As described under Drought Response Level 3 some of these activities are subject to additional requirements under those conditions:

1. Commercial agricultural operations as defined in Code Section 1-3-3.
2. Capture and reuse of cooling system condensate or storm water in compliance with applicable local ordinances and state guidelines.
3. Reuse of gray water in compliance with Code Section 31-3-5.2 and applicable local board of health regulations adopted pursuant thereto.
4. Use of reclaimed waste water by a designated user from a system permitted by the Environmental Protection Division of the department to provide reclaimed wastewater;
5. Irrigation of personal food gardens;
6. Irrigation of new and replanted plant, seed, or turf in landscapes, golf courses, or sports turf fields during installation and for a period of 30 days immediately following the installation date.

7. Drip irrigation or irrigation using soaker hoses.
8. Hand watering with a hose with automatic cutoff or handheld container.
9. Use of water withdrawn from private water wells or surface water by an owner or operator of property if such well or surface water is on said property;
10. Irrigation of horticultural crops held for sale, resale, or installation.
11. Irrigation of athletic fields, golf courses, or public turf grass recreational areas;
12. Installation, maintenance, or calibration of irrigation systems; or
13. Hydroseeding.

If necessary, the City of Cumming will obtain a variance from EPD for more stringent conservation practices in the event conditions deem increased conservation to ensure public water supply according to those priorities below.

Potable Water Use Priorities

Listed below are the City of Cumming's water use priorities with the highest priority use listed first. These priorities are part of the City's Ordinances which allow strict enforcement when required.

1. Emergency facilities using potable water for essential life support measures.
2. Agricultural use.
3. Domestic and personal uses of potable water including drinking, cooking, washing, and sanitary and health related purposes.
4. Industrial/commercial uses of potable water including hotels, shopping centers, grocery stores, car washing facilities, etc.
5. Residential and commercial outdoor uses of potable water including lawn sprinkling, non-commercial car washing, gardening, etc.

The combined stored water volume in the City's elevated storage tanks and clearwells is another good indicator for drought conditions. Storage water volume will be tracked by a procedure referred to as "Stored Water Accounting". This procedure tracks all storage volumes will be continuously tracked starting at 6 a.m. each day providing daily totals. Water production scheduled for each day should be based on the prior day's volume of water produced, adjusted by the change in combined storage volume.

Restrictions will start with voluntary banning and continue if conditions persist, to initiate mandatory priority curtailment. The City of Cumming will enforce any water bans with warning citations, fines or, if necessary, removal of the water meter. Enforcement of these procedures will be by City of Cumming Police Department or Forsyth County Sheriff's Department, whichever is applicable. The effectiveness of the water ban will be determined by continued observance of reductions in potable water demand at the water treatment plant and in water levels observed within the City's storage tanks.

The City's new raw water intake facility with a lowered intake protects against drought conditions when water levels fall below the normal pool elevations of 1071.0.

Storage of Finished Water

The City of Cumming water system has the following, proposed storage facilities.

City of Cumming	Storage Capacity (MG)
Existing Clearwells	3.14
Existing Finished Water Storage Tanks	6.80
Planned Clearwells/Storage Tank	12.75
Total Storage Capacity	**22.69**

The above listed storage capacities are not intended for drought protection. The storage facilities were designed as part of the water distribution system providing storage for hourly fluctuations of water demand and to meet fire protection flows. These storage facilities allow the water system to supply water with consistent flow to its customers only during normal conditions. As with the surrounding County and municipalities, the City relies on the storage capacity of Lake Lanier during periods of drought. Lake Lanier is expected to provide long-term storage when flows across the Chattahoochee River Basin are less than the needed withdrawals.

The city has maintained interconnection with Forsyth County for routine water sale which serves as their primary water supply source. This interconnection will remain for water sale to the County but is also retained for emergency uses.

Interconnections with other water systems provide a valuable means of increasing water system reliability. If water systems are interconnected, finished water supply can readily be available in the event of a major water system failure. These connections can function on an emergency-only basis, as a peaking supply, or they can provide major or sole sources of water supply for some water systems.

Water Supply to Northside Forsyth Hospital

With the completion of the 2.0 MG elevated storage tank at Old Atlanta Road, the City can supply water to Northside Forsyth Hospital in emergencies. The valve operations can isolate the tank to provide water to the hospital in an emergency situation.

Water Quality

As of 2016, 18 streams within Forsyth County are on EPD's 305(b)/303(d) list, many of which feed the headwaters to the Chattahoochee and were categorized as impaired and not supporting their intended use. These environmentally sensitive areas include Lake Lanier, and multiple tributaries to the Chattahoochee River. The current 303d list in Appendix L.

Prior to the implementation of process changes to the Cumming PWPF, Cumming has undertaken a source water assessment. The source water for Cumming is Lake Lanier. An internet search failed to find data regarding drinking water quality from Lake Lanier. Data that was found was more appropriately associated with wastewater assimilative capacity.

To determine the drinking water quality of Lake Lanier water, a sampling program was undertaken in 2020. Pace Analytical was retained to perform water quality testing and sampling was performed by CEC. The raw water samples are taken from the Water Treatment Plant. This testing and sampling program was completed.

The chemical compounds, pesticides, herbicides and similar compounds, which cause concern and may require advanced treatment were generally Non-Detect. If they detected, they were at levels not measurable. Many compounds were tested but the compounds that have been reported via these reports are listed in Table 4. The compounds that would require advance treatment, the organic pesticides etc. are not present. Other tested compounds had values are typical for surface water. No advance treatment is anticipated for the presence of organic pesticides etc.

PFAS compounds also known as Forever Chemicals were detected in the testing. The PFAS compounds are far below the current EPA regulatory limit of 70 ppt. No advance treatment is anticipated for the presence of PFAS compounds.

Table 5 presents part of the testing result.

Table 5 - Raw Water Quality Sampling Results

Report Date	Total Hardness	Total Alkalinity	Iron		Copper	Lead		pH	TOC	DOC	Synthetic Organic Compounds	Pesticides	Herbicides	Microcystins	1,4-Dioxane	VOC compounds	PFAS Compounds
	(mg/L)	(mg/L)	(mg/L)		(mg/L)	(mg/L)			(mg/L)	(mg/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(mg/L)	(ppt) (ng/L)
1/13/20	13.0	13.0	0.10	I	0.02		U	7.2	1.3	1.2	U	U	U	U	U	U	about 1.0
1/30/20	13.1	12.9	0.19		0.019		U	7.0	1.2	1.3	U	U	U	U	U	U	about 1.0
2/5/20	12.8	12.4	0.081	I	0.017		U	7.1	1.1	1.1	U	U	U	U	U	U	about 1.0
2/13/20	14.2	12.8	0.082	I	0.023		U	7.1	1.1	1.2	U	U	U	U	U	U	about 1.0
3/4/20	13.3	12.1	0.058	I	0.012		U	7.1	1.2	1.1	U	U	U	U	U	U	about 1.0
3/12/20	13.3	11.5	0.25		0.012		U	6.6	1.2	1.5	U	U	U	U	U	U	about 1.0
3/26/20	12.8	11.8	0.11	I	0.013		U	7.0	1.5	1.2	U	U	U	U	U	U	about 1.0
4/1/20	14.1	10.2	0.18		0.014		U	7.1	1.3	1.2	U	U	U	U	U	U	about 1.0
4/21/20	13.2	12.4	0.094	I	0.014		U	7.2	2.1	1.3	U	U	U	U	U	U	about 1.0
5/21/20	13.6	12.9	0.1		0.019		U	6.3	1.0	1.2	U	U	U	U	U	U	about 1.0
6/3/20	13.7	11.3	0.24		0.03	0.00096	I	6.8	1.3	1.2	U	U	U	U	U	U	about 1.0
6/4/20	12.1	10.7	0.14		0.029		U	7.1	1.51	1.2	U	U	U	U	U	U	about 1.0
6/22/20	12.6	11.7	0.07		0.016		U	6.8	2.74	5.1	U	U	U	U	U	U	about 1.0
6/30/20	12.4	11.0	0.17		0.032		U	7.1	1.5	1.56	U	U	U	U	U	U	about 1.0
7/9/20	12.1	12.6	0.33		0.029	0.00027	I	6.9	1.52	1.43	U	U	U	U	U	U	about 1.0
7/16/20	11.7	13.4	0.085		0.042		U	6.4	2.05	1.47	U	U	U	U	U	U	about 1.0
7/28/20	12.7	12.9	0.13		0.050		U	7.7	1.39	1.67	U	U	U	U	U	U	about 1.0
8/11/20	12.1	14.1	0.28		0.037	0.00050	I	7.9	1.3	1.4	U	U	U	U	U	U	about 1.0
8/21/20	12.1	12.9	0.31		0.033	0.00025	I	8.6	1.2	1.4	U	U	U	U	U	U	about 1.0
9/8/20	13.4	15.1	0.51		0.031		U	8.1	1.4	1.2	U	U	U	U	U	U	about 1.0
9/13/20	13.1	15.9	0.37		0.0081		U	6.4	1.4	1.2	U	U	U	U	U	U	about 1.0
10/9/20	11.8	15.6	0.38		0.022	0.00051	I	7.4	1.6	1.6	U	U	U	U	U	U	about 1.0
10/27/20	12.0	14.1	0.29		0.018		U	6.4	1.4	1.6	U	U	U	U	U	U	about 1.0
11/10/20	11.9	13.1	0.80		0.020	0.00068	I	7.6	2.1	2.0	U	U	U	U	U	U	about 1.0
11/13/20	12.0	14.6	1.00		0.025	0.00082	I	6.5	1.6	1.6	U	U	U	U	U	U	about 1.0
12/9/20	11.9	14.4	0.13		0.014		U	6.5	1.6	1.7	U	U	U	U	U	U	about 1.0
12/23/20	13.9	14.1	0.24		0.018		U	7.1	1.8	36.7	U	U	U	U	U	U	about 1.0
1/8/21	12.9	13.5	0.36		0.014	0.00032	I	6.4	1.3	U	U	U	U	U	U	U	about 1.0
1/12/21	12.9	13.2	0.23		0.019		U	8.1	1.2	1.2	U	U	U	U	U	U	about 1.0

ANALYTE QUALIFIERS	
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Compound was analyzed for but not detected.

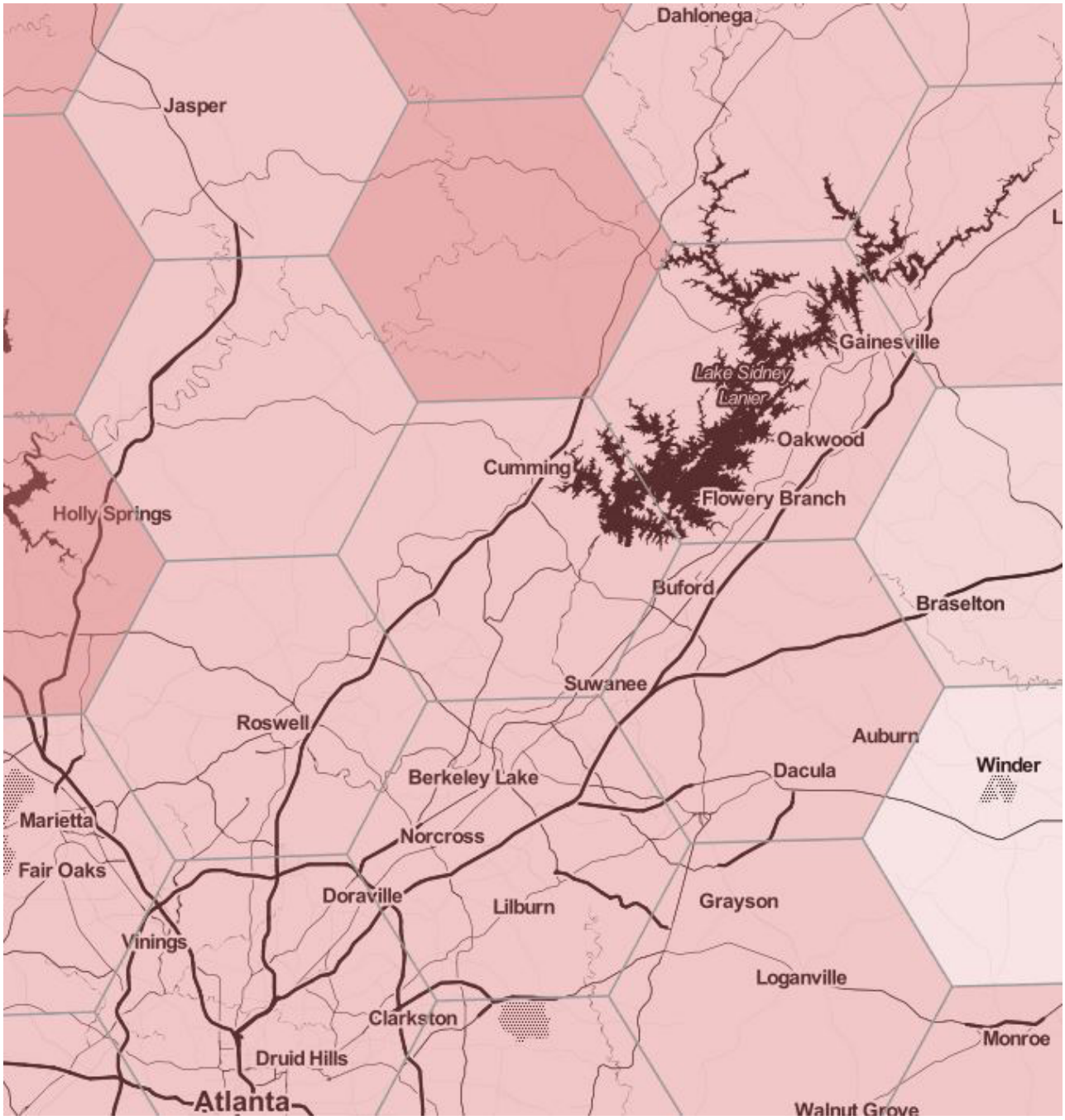
Wetlands and Protected Species

Wetlands are areas where the frequent and prolonged presence of water at or near the soil surface influences the kind of soils that form, the plants that grow, and the fish and/or wildlife communities that use the habitat. Swamps, marshes, and bogs are several types of readily recognized wetlands. Many wetland areas within the city's service area are located along major streams such Big Creek, Settingdown Creek and their tributaries. Additional wetland areas are also present around the Lake Lanier shoreline. The City of Cumming Code of Ordinances provides requirements for jurisdictional determination of wetland areas for all new developments.

In addition to identifying and preserving wetlands, the Georgia Department of Natural Resources Wildlife Resources Division maintains some extensive databases of rare species and natural communities in Georgia. These rare natural elements are defined as plant and animal populations, natural plant communities, bird nesting colonies, caves and other features in nature that are considered important for biodiversity conservation. The main databases include biotics data and their location, state wildlife plan, tracked special concern species, high priority species, and U.S. and Georgia protected species lists.

Figure 3 - Protected Wildlife and Rare Natural Elements Hexagons

Within the city's service area boundary are four overlaid "hexagon" areas (Hex 105, 125, 126, and 147) defining those listings for rare species and rare natural elements within each. An interactive map of the databases can be found at https://georgiabiodiversity.org/portal/element_unit_map/hex24/ga_protected and is shown in Figure 3. Protected Wildlife and Rare Natural Elements. The four species lists that correspond to each hexagon are included as part of this report under the appendix.



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SECTION III
System Inventory and Evaluation

The following sections detail the existing facilities and infrastructure that comprise the City of Cumming's water system. The system generally consists of the raw water source and related intake facility with the transmission main to the Potable Water Production Facility. The treatment facility includes a main treatment plant, clearwells for finished water storage, and a peaking plant to assist water production during high water demand periods. Finished water is then pumped out to the distribution system which includes elevated storage tanks, fire hydrants and booster pump stations where additional water pressure is required.

Raw Water Source

The sole source of raw water for the City of Cumming is surface water from Lake Lanier. The City of Cumming owns and operates the only raw water intake facility (RWIF) in Forsyth County and holds the only easement from the U.S. Army Corps of Engineers or storage contract. The City and Forsyth County share the operational costs of the RWIF via the "Water Users Agreement". The City and County both hold EPD withdrawal permits. The City's withdrawal permit allows for the withdrawal of 21 MGD maximum daily and 18 MGD maximum monthly. Current copies of the city's Raw Water Withdrawal Permit 058-1290-07 (as modified Jun. 2018) and the PWPF Cumming Water Production Permits CS1170000 (as modified Jan. 2020) are included under appendix E.

Normal full pool elevation of Lake Lanier is 1071 MSL and the bottom of the conservation pool is 1035 MSL. In 2007, the water level in Lake Lanier fell to levels below 1051 MSL and remained at unprecedented low levels for much of 2008 and 2009. At that time, the City of Cumming began, and has since completed construction of, the RWIF III. The new facility, in conjunction with the 78-inch intake pipe which extends approximately 3,000 LF into Lake Lanier, allows the City to operate the raw water intake pumps at water levels below the conservation pool elevation of 1035 MSL.

Source Water Protection plans have been implemented through the county as the intake area is outside the city's service area. Additionally, the city's water conservation plans and drought contingency plans have been updated and included as part of this master plan.

Raw Water Intake Facility (RWIF)

The City originally withdrew raw water from both Dobbs Creek and Bald Ridge Creek. Then, in the late 1970's the city secured a permit from the U.S Army Corps of Engineers and built the first raw water intake which had the ability to withdraw up to 8 MGD from Lake Lanier. In 1989 a secondary backup intake facility was built, and the original was decommissioned.

The current intake was commissioned in 2010 allowing withdrawal at lower surface water elevations than previous. The current intake was sized to replace the capacity of the second intake, as well as increased demands into 2040. The current Intake is designed to accommodate up to eight vertical turbine pumps and has ultimate capacity for pumping up to 105 MGD. The original Lake Intake is operational and can be used on a temporary basis, if needed; when the City installed an emergency standby generator, the intake was used to supply water for approximately two weeks.

The current Intake was configured to ultimately house 8 pumps, but currently has five online. Three are designated for the city's service area use and two are for county use. Future pads are available for the addition of 3 more pumps and related transmission lines (two for the County and one for the City). Current designated pump locations and facility layout is shown in Figure 4 - Raw Water Intake Facility III. If the County requires additional pumping capacity, the service delivery strategy allows for such construction if it is dedicated back to the city for ongoing maintenance and operation.

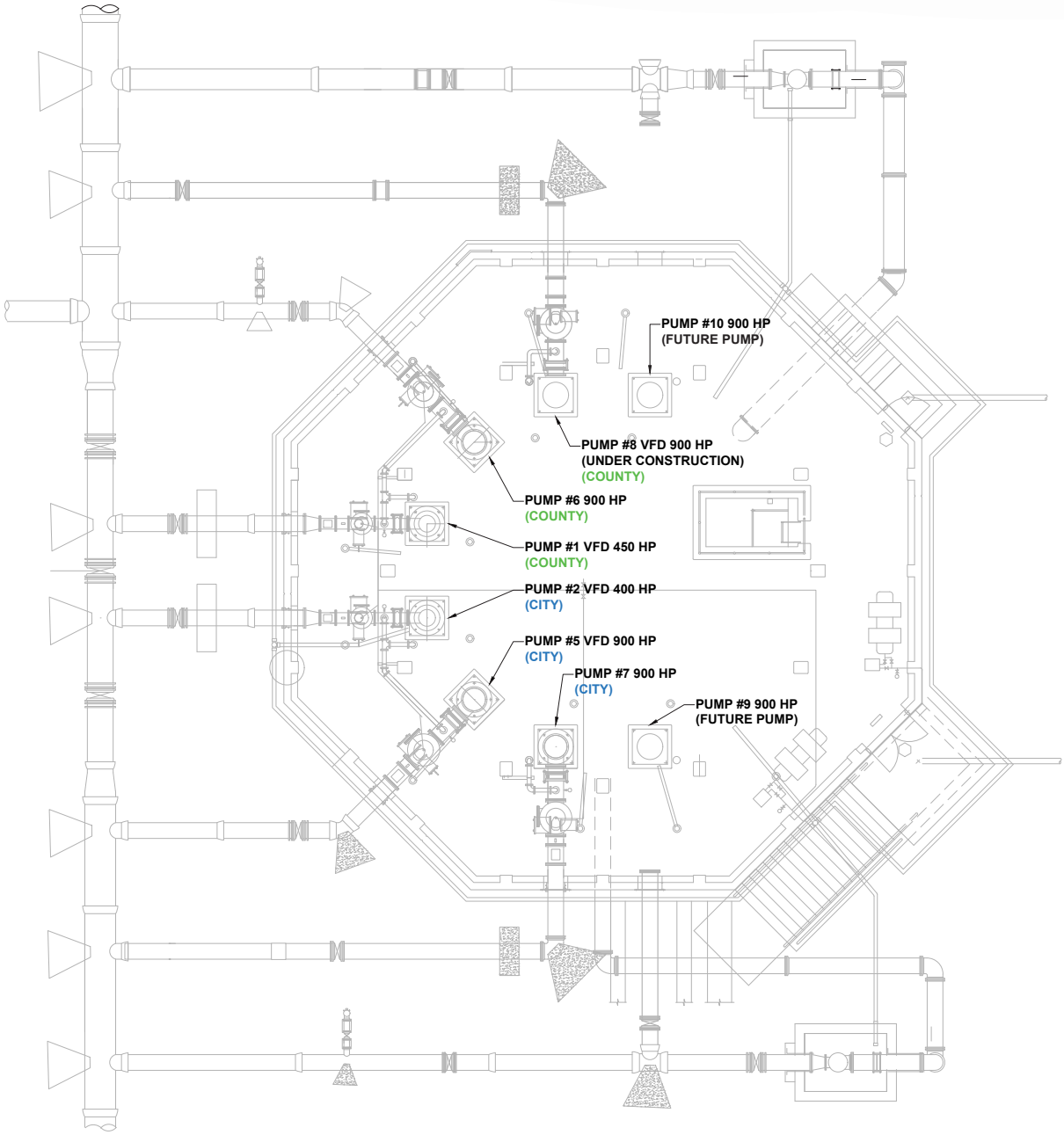


Figure 4 - Pump Configuration at RWI III

From the intake facility, a withdrawal line of 66-inch dia. terminates at a sump pool area with a screened end. From the sump pool a second larger 78-inch line installed flat with top of pipe roughly at elevation 1026 reaches further out to deeper areas of Lake Lanier to ensure withdrawal capacity during periods of lower lake levels.

The City uses one 400 HP pump (Pump #2), one 900 HP pump (Pump #5), and one 900 HP pump (Pump #7) to deliver raw water to the City's PWPF. These three pumps have capacity for delivering approximately 25 MGD to the City's PWPF through one 42-inch and a combination of 30-inch and 16-inch DIP mains. The City's RWIF II, which includes two 600 HP pumps, is available for pumping raw water to the City's water plant. However, Intake II cannot operate at lake levels below 1042 MSL. Intake III can operate below lake levels of 1035 MSL, the bottom of the conservation pool of Lake Lanier.

The County uses one 450 HP pump (Pump #1) and one 900 HP pump to deliver raw water to the County's water plant. These two pumps can deliver 27 MGD to the County's plant though their 42/48-inch force main.

Potable Water Production Facility (PWPF)

The city's Potable Water Production Facility is located on over 31 acres owned by the City of Cumming at 935 Dahlonega Highway that also includes the City's Dobbs Creek Park. A recent expansion for the facility in 2009 brought filtering capacity to 24.1 MGD. The original plant, since expanded several times, now has maximum day capacity of 21 MGD and average day capacity of 18.1 MGD. The facility layout is shown in Figure 5.

The facility is composed of two components. The first component shown toward SR 9 is an 18 MGD surface water production facility. The oldest part of the facility was constructed in 1959 and the newest part of the facility was constructed in 1995. Two clearwells were constructed, one for one million gallons and one for two million gallons.

Main processes of the 18 MGD plant consist of chemical addition, flocculation, sedimentation, and filtration. The sludge collection system was upgraded in early 2011. The new chemical building was installed in 2021. The Powered Activated Carbon (PAC) silo was installed in 2022.

The second component is a 6 MGD package water treatment plant. It is Suez package plant using plate settlers and conventional media filtration.

The 2009 expansion utilized a packaged plant for peak flow conditions to add 6 MGD of treatment during periods of high demand. The (3) 2.0 MGD Micro-floc Trident units treat turbidity, suspended solids, color, iron, manganese, odor, taste and parasites (ie, Giardia lamblia and Cryptosporidium) at lower capital costs than older conventional systems while allowing higher flow rates through the plant.

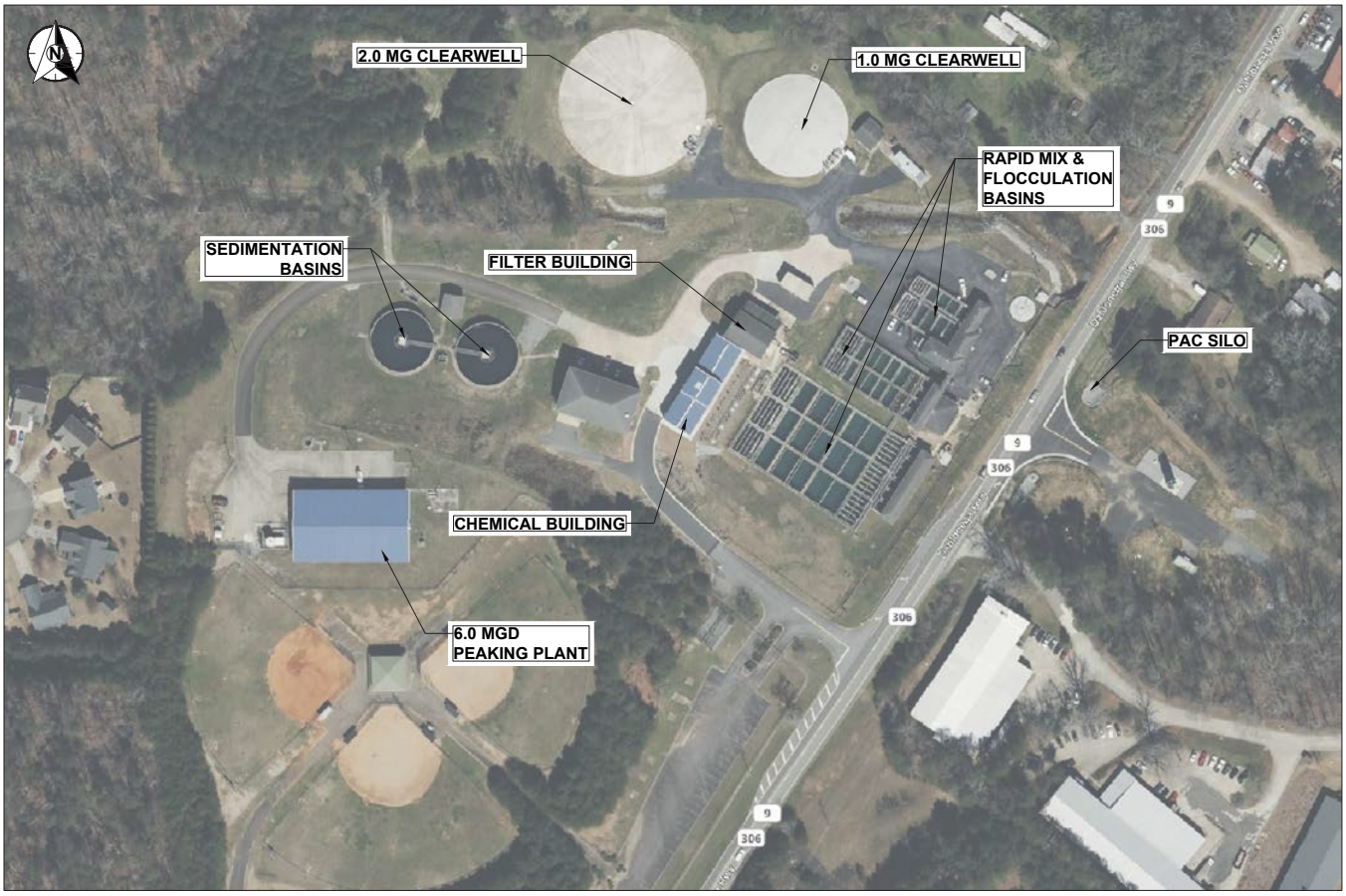


Figure 5 - Potable Water Production Facility Layout

The water production main plant processes are described below and shown on a current process flow diagram included in the appendix.

- Flow measurement: Parshall flume and sonic flow meter measure incoming volume.
- Rapid mix and floc: Aluminum sulfate, hydrated lime, and polymer are added to cause particulates to coagulate and "floc" together. A baffled system of "over and under" plates slows flow and allows increased contact time to assist coagulation of floc particles.
- Sedimentation basin: From the floc chamber, the sedimentation basin with stainless steel baffles is complete, the clarified water is skimmed from the surface of the basin over a weir and gravity fed through the multimedia filters.
- Filtration: Clarified water is sent through multimedia filters of anthracite coal, well-graded sand, two grades of garnet, and three grades of gravel. Periodic back washing keeps the filters clean and continuing to filter at high production rates. Backwash filtrate pumped to solids dewatering.
- Solids dewatering: Collected basin drainage water, overflows, sludge collection system and filter backwash is treated through sludge thickener tanks for complete stabilization and decant flows released back to Sawnee Creek which flows into Lake Lanier.

- Sludge Processing: Thickened sludge is further processed in conditioning tanks (polymer added) and resulting belt pressed solids deposited at Hwy 9 Sludge Holding Ponds.
- Post-Flash-Mix: Final "polishing" to meet Federal standards for the Clean Water Act is accomplished with addition of fluoride, chlorine, phosphate, and lime.
- Storage: Cleaned water is stored in the clearwells on-site at the PWPF and/or in one of the city's elevated and ground storage tanks throughout the distribution system.

PWPF Peaking Plant (6.0 MGD)

The peaking package plant was added in 2009 to provide additional finished water during higher demand periods. The plant includes enhanced coagulation with tube settlers, higher rate settling and adsorption clarification, and filtration. The Micro-floc Trident units (by Siemens Water Technologies) provide a higher production rate than the existing processes.

The expansion included a new raw water booster pump station located across Highway 9 from the main plant and is dedicated for raw water to the new peaking plant. Prior to processing through the peak plant, pH adjustment is made with liquid lime, and coagulant and polymer also added to induce flocculation of particles. A sludge recycle flow is introduced near the coagulation point, to aid in floc formation, and serves to maintain a more steady-state solids concentration.

The coagulation with tube clarification reduces influent solids concentration prior to the adsorption clarifying. This leaves most coagulated particles in the tube clarifier. For cold water conditions and periods of high turbidity raw water, the tube clarifier provides detention time reducing plant waste volume and improving organics removal.

The settled solids dewatering area treats collected flows from the basin drains, overflows, sludge collection system and filter backwash. Settled solids are pumped to two sludge thickeners. The decant water off the sludge thickening process is released to Sawnee Creek which then flows to Lake Lanier. The thickened sludge is further processed in conditioning tanks where it is treated with polymer before entering the filter press. Resulting solids are deposited across Highway 9 at the old sludge holding ponds.

PWPF Deficiencies and Recommendations

In 2022, the City proposes to construct new facilities at a high elevation and to replace older treatment processes with newer treatment processes:

1. The City of Cumming proposes to build new clearwell and high service pumping at a higher elevation than existing facilities, at approximate elevation 1184 feet versus the approximate elevation of the existing facilities, 1140 feet. This is 44-feet higher. These proposed facilities are intended to provide redundancy to existing facilities and operations.
2. The City of Cumming proposes to convert its existing 6 MGD treatment train from conventional media filtration to ceramic membrane filtration. It is intended that new treatment will provide a higher level of treatment and will provide greater treated flow.

Finished Water Storage

Throughout the distribution system, the city currently has five elevated storage tanks, four ground storage tanks, and four clearwells located on site at the PWPF. Currently the utilities' storage is 9.84 MG, including storage tanks and clearwells.

The two clearwells (1 MG and 2 MG) at the PWPF, shown in Figure 5, are circular pre-stressed concrete served by three high service pumps. Three high service pumps feed the 1 MG clearwell and two high service pumps feed the 2 MG clearwell.

The City's property at the PWPF will be fully utilized by treatment processes upon completion of the proposed 6.0 MG clearwell. Costs of relocating some or all the water treatment facilities is not feasible. The existing facility has been expanded over the years and large transmission mains and storage facilities and the distribution network have been planned and designed with the current location remaining. Therefore, future upgrades when required should consider membrane technology, which uses a much smaller footprint than conventional methods.

Cumming Utilities has a total of 6.80 MG of finished water storage, to serve its customers, in a combination of ground and elevated storage tanks. Table 6 contains a listing of all finished water storage facilities within the distribution network and their respective capacity with conveyance.

Table 6 - Cumming Utilities Finished Water Storage

DISTRIBUTION SYSTEM STORAGE FACILITIES			
LABEL	**NAME**	**YEAR BUILT / UPGRADE**	**STORAGE CAPACITY (MG)**
T1	Elevated Ridge Tank #1	Renovated 2006	1.0
T2	Elevated Ridge Tank #2	Renovated 2006	0.5
T3	Elevated Coal Mountain Tank (State Barn Tank)	Renovated 2021	0.5
T4	Elevated Hendix Rd Tank	Renovated 2021	1.0
T5	Elevated 2.0 MG Northside Hospital Tank	2020	2.0
G1	Sawnee Mountain Ground Tank #1	Renovated 2003	0.8
G2	Sawnee Mountain Ground Tank #2	Renovated 2003	0.5
G3	Hughes Mountain Rd Ground Tank	2017	0.25
G4	Sawnee Drive Ground Tank	2020	0.25
		TOTAL EXISTING DISTRIBUTION STORAGE	6.80

WATER TREATMENT STORAGE FACILITIES			
LABEL	**NAME**	**YEAR BUILT / UPGRADE**	**STORAGE CAPACITY (MG)**
C1	Clearwell #1		0.14
C2	Clearwell #2	1996	1.0
C3	Clearwell #3	1996	2.0
		TOTAL EXISTING TREATMENT PLANT STORAGE	3.14

Distribution Network

The City maintains a distribution system of over 300 miles of water lines to consistently deliver clean water to the city's customers. Line sizes range from 2-inch diameter domestic lines to large 36-inch diameter transmission mains. Table 7 shows the length of pipe by water line size within the city's system and as current with the included water model for the system. The lines are also represented on the updated Cumming Utilities Water System Map with anticipated areas of new and/or updated lines into 2040.

Table 7 - Water Main Sizes and Lengths

Finished Water		Raw Water	
Diameter (inch)	Length (ft)	Diameter (inch)	Length (ft)
<6	288,847	16	9,120
6	398,346	30	9,043
8	906,743	42	6,848
10	26,223		
12	337,947		
16	63,969		
18	26,269		
24	6,495		
30	2,802		
36	26,120		
48	153		

Booster Pump Stations

Currently the City has seven booster pump stations as part of the distribution system to ensure adequate system pressure across the service area. City ordinances also require developments or individual requests for water service above elevation 1280 MSL to provide booster pump facilities with proper design and configuration to supply proper fire flow pressure to the city's system. Table 8 shows each pump station and corresponding pump data.

Table 8 - Booster Pump Station Inventory

BOOSTER PUMP STATION						
LABEL	NAME	YEAR BUILT / UPGRADE	PUMPS			NOTES
			FLOW	TDH	HP	
			(GPM)	(FT)	(HP)	
B2	Ashebrooke Booster PS	2012	750	114	30	One Fire Pump
			170	135	10	Two Domestic Pumps
B3	Mountain Road Booster PS	2017	136	255	20	Two pumps serving Mountain Rd Ground Tank
B4	Tower Road Booster PS					Private
B5	Wickersham Booster PS	1994	78	108	5	
B6	Sawnee Drive Booster PS	2020	136	255	20	Two pumps serving Sawnee Drive Ground Tank
B6	Old Smithdale Heights Booster PS	2007				To be replaced

SECTION IV
Future Demand Forecasts

Service Area Characteristics & Demographics

The City of Cumming faces many challenges for providing potable water service because of a rapidly growing and changing population, a diverse topography and managing and conserving water resources.

The City service area encompasses approximately 52 square miles of land comprised of the corporate limits for the City of Cumming which is 5.5 square miles, plus 46.5 square miles outside city limits for unincorporated Forsyth County. Generally, the service area is bounded by Bethelview Road and Dr. Bramblett Road to the west, Highway 369 to the north, Bald Ridge Creek and the Gwinnett County line (along Chattahoochee River) to the east and Highway 20 and Georgia 400 along the south.

While the service area has expanded well beyond the city limits, this growth and trend are expected to continue. Proximity to Lake Lanier coupled with major travel routes through the city will continue to be strong drivers of increased population as well as higher employment from new businesses and industries to the area. Developments such as employment centers and communities with higher density along the major travel corridors will require added capacity and networks of infrastructure to support that growth.

Key infrastructure that includes reliable water and wastewater treatment capabilities, transportation, and modern communications infrastructure systems will be needed. With Lake Lanier as the largest body of water in Georgia, and as the sole source of raw water to the region, population forecasts were analyzed with a broader perspective and increased attention given to the conservation of water to better support the expected demands which will be placed on the city's water system.

Topography

The diverse topography within the city's service area creates some challenges in providing potable water because of the elevation differences from two ridgelines which separates the service area. Shown in Figure 9 below, the service area extends from the shorelines of Lake Lanier westward across two ridgelines. One smaller ridgeline is located parallel and to the west of Georgia 400. A second larger ridgeline with top elevations of 1680 and 1967 feet is parallel and further west of highway 400. Elevations within the service area range from below 1000 MSL, near the Gwinnett County line at the Chattahoochee River, to above 1600 MSL in the areas around Sawnee Mountain. Figure 6 shows the more prominent topography in the area.

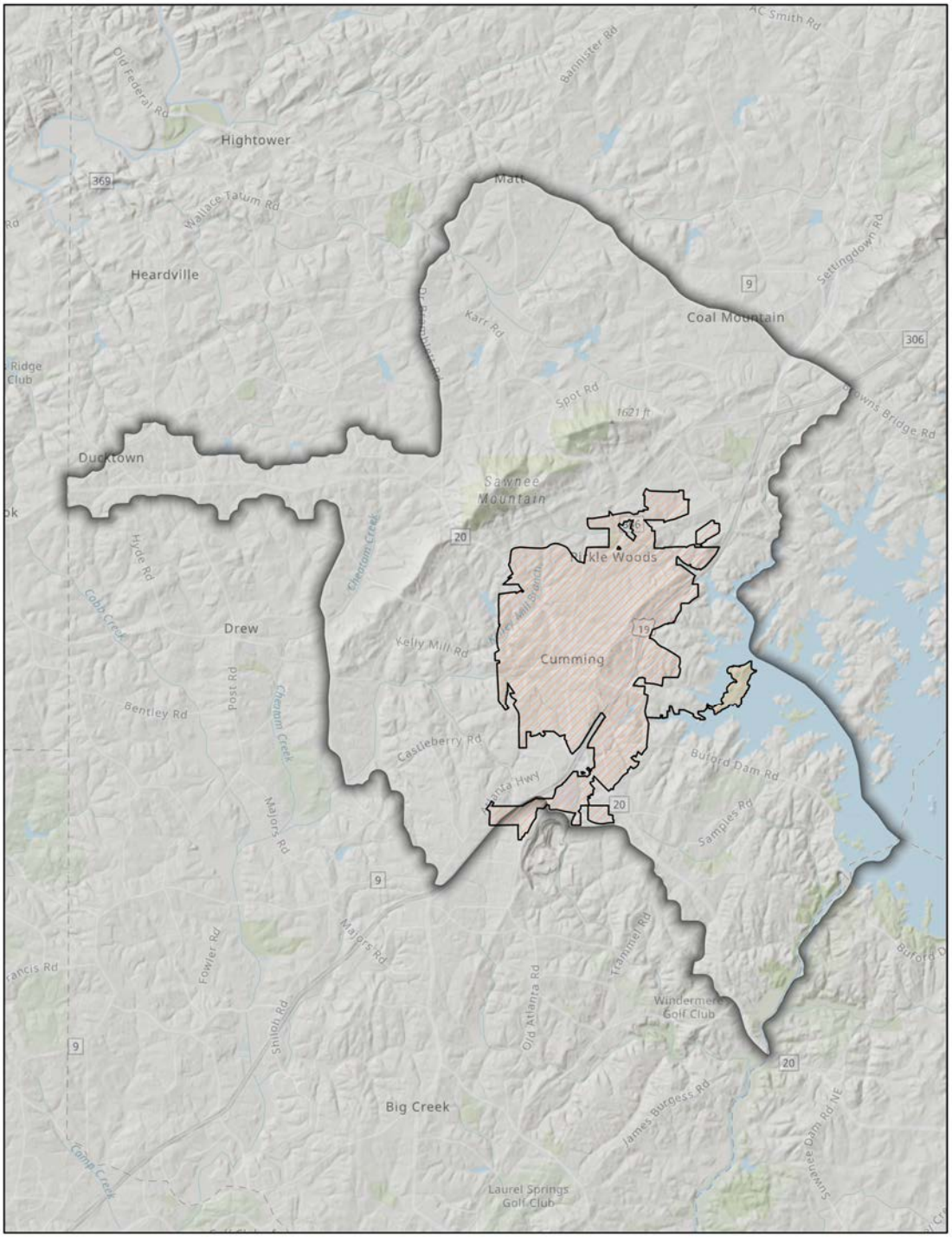


Figure 6 - City Limits and Topography

Storage tanks in the distribution system operate at an overflow elevation of 1421 MSL. The City requires that all developments located above elevation 1280 MSL be served by booster pumping systems.

Population Estimates and Forecasts

The City of Cumming and Forsyth County population grew fast over the past two decades. During the decade 2000 to 2010 the County's population grew by 78.4% (98,407 to 175,511). During the decade 2010 to 2020 Forsyth County's population grew by 43.17% (175,511 to 251,283). From 2019 to 2020, the Census Bureau showed Forsyth County's growth at 3.7%, which is above the average of 0.75% for the state of Georgia.

During years following the 2008 Great Recession, growth did slow, but is returning to similar trends observed prior to the economic downturn. Below is a historical graph of county-wide growth since the 1800's, which shows a marked population increase in the Forsyth region.

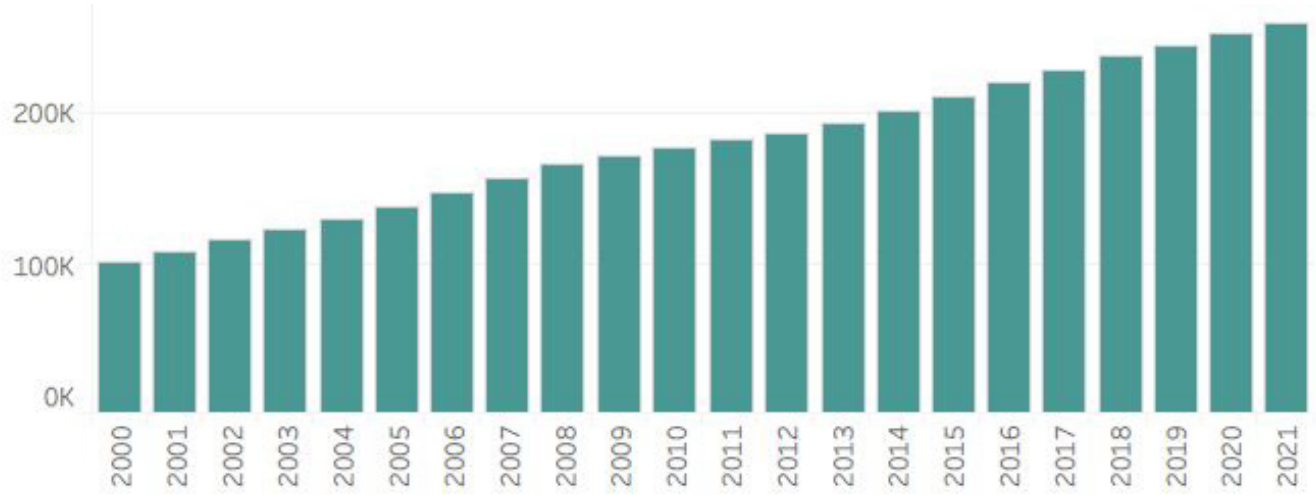


Figure 7 - Forsyth County Historical Growth since 2000

Source: https://33n.atlantaregional.com/21-county-data-dashboard

The same key factors which contributed heavily to the regions' population will continue to drive area growth on the county and local levels. These key factors are the proximity to Atlanta (about 30-40 minutes from Cumming to Atlanta), less than 2-hour proximity to other nearby Metropolitan Statistical Areas (MSA), and the recreational features of the Sawnee and Blue Ridge Mountains and Lake Lanier, the largest body of water in Georgia.

The following population projections for city of Cumming coincide with the most recent 2022 updates to the Metropolitan North Georgia Water Planning District's (MNGWPD) Water Resource Management Plan.

According to the updated 2022 MNGWPD Water Resource Management Plan, OPB Series 2020 Population Projections, Medium Projections model has been used for Forsyth County population projection. The City of Cumming has a pro-growth policy within the city limits as greater growth is anticipated within the City while Forsyth County has an anti-growth policy. Therefore, for the City of Cumming service area, OPB Series 2020 Population Projections, High Projections model has been used for the population projection.

In comparison to the City's previous 2017 Water Master Plan, population projection numbers for the area have increased. The increases were a result of adjustments from changing the population projection model from ARC used in 2017 to OPB High used in 2022. The strong growth occurring in the Upper Chattahoochee Basin is being led by major arterial improvements, and employment centers developed along these corridors.

Since OPB projections are county based, the census tract-based population projections from the Atlanta Regional Commission (ARC) were used for calculating the population percentage of Cumming service area in Forsyth County. Then Cumming service area population is projected by applying the calculated percentage from ARC to the OPB Forsyth County population projections.

Overlay of respective census tracts with the city's service area is shown in Figure 8 - Service Area Census Tracts Map. Population figures for the city's service area were further developed from the overlay of U.S. Bureau census tracts bounded by the city's service area limits using GIS software. For census tracts only partially within the service area, a revised delineation was achieved by subtracting the tract areas which were outside of the service area, then creating a ratio of the portion which lies inside the service area. This ratio was then applied to ARC forecasted population growth numbers. Any census tracts outside the limits of the city's service area were not used since Forsyth County is expected to provide service to these areas. The city service area includes in full and in part, only 21 census tracts.

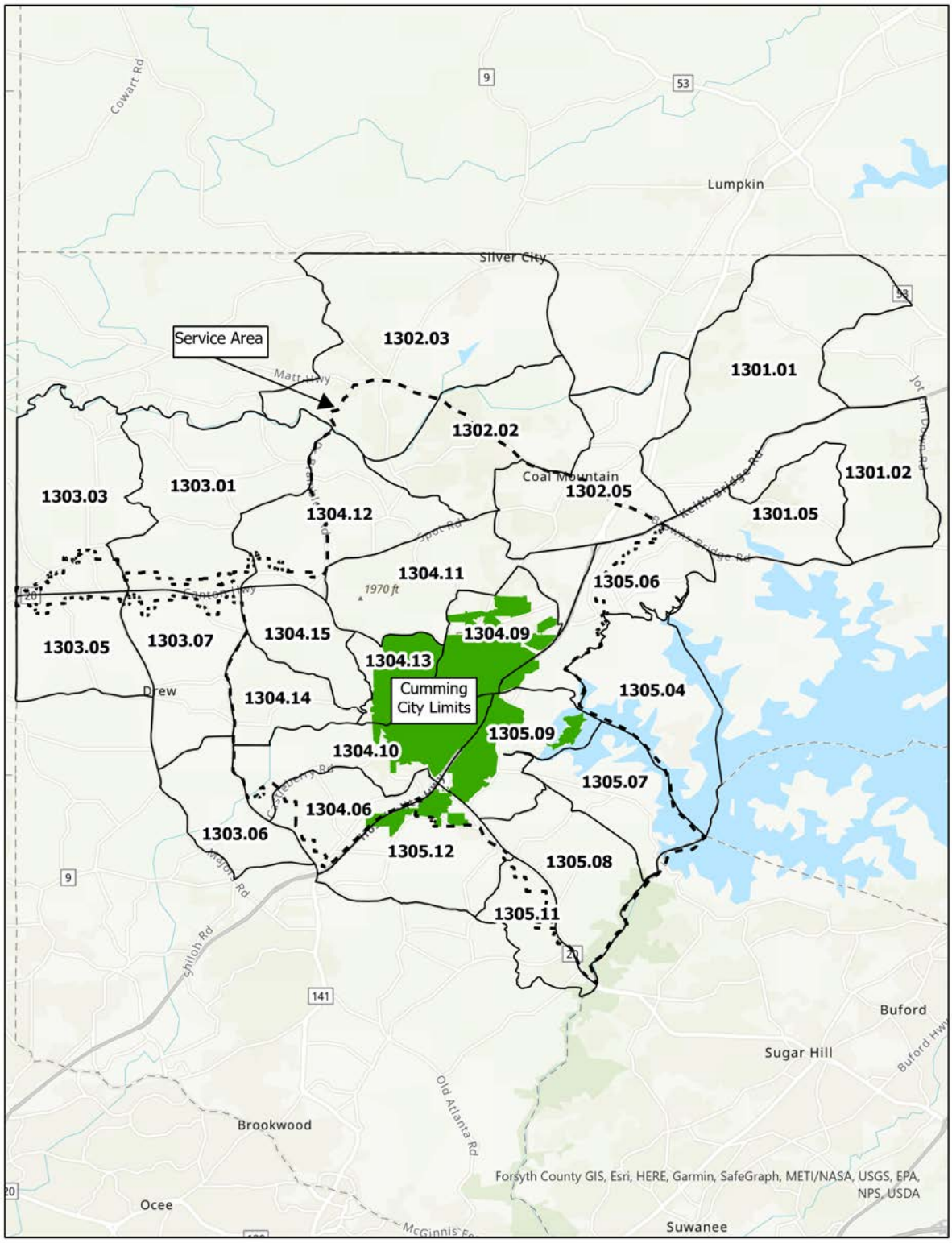


Figure 8 - Service Area Census Tracts Map

From the ARC population forecasts for years 2015, 2020, 2030, 2040, and 2050, and adjusted tract population numbers within the service area, percentages of Cumming Service Area population to Forsyth County population are calculated. With the projected Cumming Service Area population calculated by the percentages and the OPB total population, the resulting trend line was generated and 2035 and 2050 then extrapolated from the graph. A third order polynomial trend line was used as most descriptive for population growth given maximum populations which the area can physically sustain. The population trend line is shown in Figure 9.

Additional ARC raw data and complete spreadsheet calculations have been included in the appendix along with supporting information for historical population estimates and forecasts made by the Atlanta Commission. In most instances since the 1990's, actual population numbers forecasted by ARC have consistently exceeded the forecasts.

These estimates include considerations for land use, transportation influences, historical trends and many other factors as modeled by the Atlanta Regional Commission (ARC). Supporting population details are included in appendix Y. The trendline graph for forecasted population growth is shown in Figure 9.

Table 9 - City Service Area Population Growth Data

YEAR*	CITY SERVICE AREA POPULATION (OPB HIGH)	FORSYTH COUNTY POPULATION (OPB MID)
1990	8,596	44,083
2000	19,189	98,407
2005	26,840	137,643
2010	45,191	175,511
2015	52,413	211,250
2020	55,132	251,283
2030	90,367	334,204
2040	115,246	418,482
2050	156,150	544,518
2060	217,024	712,024

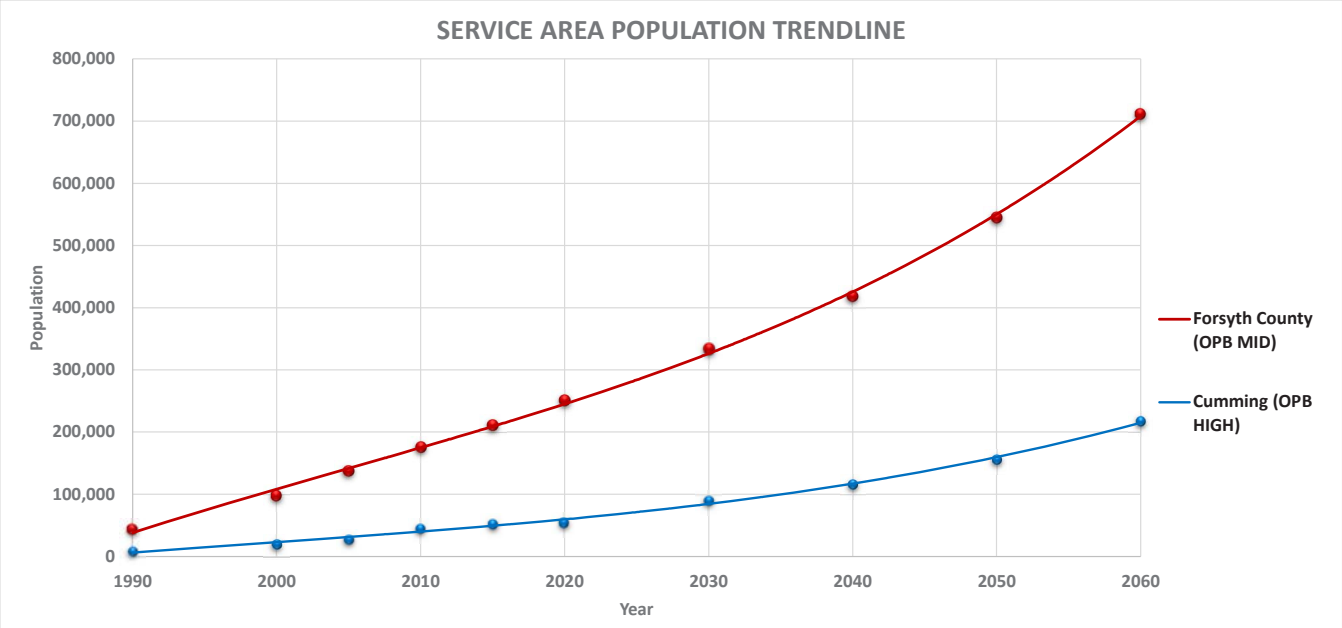


Figure 9 - Service Area Population Growth Trendline

Table 10 - Estimated Population in Service Area 2020

2020 Census Tract	Census Tract Area (sq. mi.)	Census Tract within Service Area (sq mi)	Percent Area in Service Area	Population (Census 2020)	Population within Service Area (% X Pop.)
1302.02	6.02	2.86	47.46%	5,330	2,530
1302.03	12.17	1.79	14.74%	5,523	814
1302.05	6.57	3.14	47.72%	4,561	2,177
1303.01	8.10	0.60	7.36%	7,104	523
1303.03	7.08	0.85	12.01%	3,435	412
1303.05	3.89	0.30	7.83%	6,040	473
1303.07	4.76	0.40	8.33%	6,062	505
1304.06	2.77	2.32	83.77%	6,886	5,769
1304.09	3.43	3.43	100.00%	3,601	3,601
1304.10	4.55	4.33	95.27%	8,289	7,897
1304.11	5.73	5.73	100.00%	2,046	2,046
1304.12	5.63	3.79	67.27%	3,656	2,459
1304.13	1.99	1.99	100.00%	2,720	2,720
1304.14	2.56	2.56	100.00%	4,675	4,675
1304.15	2.83	2.83	100.00%	3,104	3,104
1305.06	4.12	1.97	47.85%	3,622	1,733
1305.07	3.84	3.84	100.00%	2,951	2,951
1305.08	4.43	4.43	100.00%	5,318	5,318
1305.09	3.79	3.79	100.00%	4,177	4,177
1305.11	2.35	0.35	14.84%	5,795	860
1305.12	4.71	0.59	12.50%	3,108	388
		51.88			**55,132**

	2020	
Forsyth County Population	**251,283**	**from Census Bureau**
1Adjusted Service Area Population	**55,132**	
City Service Area Population / Forsyth County Population	**21.94%**	

The Atlanta Regional Commission estimates growth rates at around 1.5% which is less than the historical 3.0% from the 1950's through 2000. However, the economy is returning to a growth higher than what occurred during the recession of 2008.

"ARC's Series 16 forecasts anticipate, for 2050, approximate 8.6 million persons in our 21-county area along with about 3.9 million jobs. From 2020 to 2050, the 21-county Atlanta Region is forecast to add 2.4 million residents. Average annual growth rate 2020-2050 is a modest 1.5%, which while strong (and higher than during the recession) is a departure from more robust historical trends. The average annual regional population growth rate between the 1950s and the 2000s was 3%. Employment for the 21 county Atlanta Region is projected to increase by 0.74 million jobs between 2020 and 2050. The average annual employment growth rate during this period is forecast at 0.79%." (From the Atlanta Regional Commission's website: https://atlantaregional.org/atlanta-region/population-employment-forecasts/)

The above population analysis assumes Cumming Utilities service area remains the same into plan year 2060, and would not include expansion of the service area. Other influences on population estimates were reviewed which include Land Use for both the city and county, transportation access/expansion and demographics for the region, including employment trends and major types of industries recently located in the area.

Land Use and Transportation Impacts

Historically, development has been shown to concentrate around major transportation corridors and where utility services are already established, population growth forecasts were reviewed in contrast to other regional plans growth rates to better estimate growth and the types of growth expected for the service area.

Transportation improvements are expected to increase the population and encourage economic growth. Particularly along the Ga. Highway 400 (north-south corridor through the city) and Ga. Hwy 20 (east-west corridor through the city). In the ARC 2040 Transportation Plan, Highway 400 and multiple cross roads along the southern portion of the service area are expected to receive road improvements and/or expanded. Similarly, Highway 20 is expected to be widened from 2 lanes to 6 lanes by 2020. Utility systems will be impacted by increased permanent residents, those who commute to work outside the city, as well as tourists and recreational visitors. In November of 2014, Forsyth County approved up to $200 million general obligation bonds to finance a variety of transportation projects and 159 roads covering over 50 miles were resurfaced.

Estimates of the area of existing land use categories were developed using Forsyth County and City of Cumming existing land use and zoning maps. The land use maps found in Appendix I show the approximate locations of land use categories within the service area. Table 11 below provides a summary of the corresponding acreage and percentage associated with the land use as bounded by Cumming's service area.

Table 11 - Existing Land Use for Cumming Utilities Service Area

Land Use Category	Approximate Area (acres)	Approximate Percent
Residential	13,254	38%
Agricultural/Forestry	6,136	18%
Vacant	6,055	18%
Right of way/Other	2,840	8%
Parks/Recreation/Conservation	1,973	6%
Commercial	1,493	4%
Industrial	1,378	4%
Public-Institutional	1,224	4%
Office-Professional	127	0.4%
Transportation/Communications/ Utilities	101	0.3%
Total	**34,582**	**100%**

The largest category of land use is residential as 38% of the service area. These areas consist of single-family units and are located mainly outside the city limits. Residential areas west of the City, between Bethelview Road and Highway 20, and southeast of the City, between Highway 20 and Lake Lanier are more densely populated than the northern portions of the service area.

County character areas and City and county land use patterns were considered for indications of necessary infrastructure based on the type of future development expected. Land use serves as a general guide for planning future expansions of the system. It also assists in planning for the needs of the community while safeguarding natural resources and special interest areas such as Lake Lanier to the east or the Sawnee Mountains to the west of the City.

Based on Forsyth County land use planning, the City anticipates areas for rapid growth to include corridors along the east-west Highway 369, Highway 400 corridor, future greenway projects west of the city limits, along waterways to the east and southeast of city limits. To the south of city limits along Hwy. 400, the county is expecting added growth for heavy industrial and "employment center" type growth. To the north of city limits along Highway 400, "village living" areas are expected. Employment centers typically include a mixture of manufacturing, warehousing, wholesale, and commercial and office with retail and high intensity residential as accessory uses to creating a live/work and play environment. Village Living areas are high density residential type developments including mixed-use designs and most often located adjacent to transitional or development corridors.

Agriculture was still the second largest land use category in 2022, comprising approximately 18% of the service area. The agricultural areas consist mainly of several large tracts in the northern and western portions of the service area.

Approximately 18% of the service area remains undeveloped. Most of the undeveloped land is located on either side of Georgia 400 with several other large tracts spread throughout the service area.

Parks, recreation, and conservation areas comprise approximately 6% of the service area. Much of the park land is located at Forsyth County's Sawnee Mountain Preserve and Central Park. Additional park, recreation, and conservation land is located along Lake Lanier, including Mary Alice Park.

Commercial land comprises approximately 4% of the City's service area, mainly located within the City limits. Additional commercial is also located along Highway 9, north and south of the City limits, and along Highway 20, east and west of the City limits.

Industrial land use comprises approximately 4% of the City's service area. Much of the industrial areas are located within the City limits with a few smaller tracts at the southern and western ends of the service area. Although industrial land makes up a small percentage of the service area, the industrial water demands can be very large. While Tyson Foods is the City's largest single water customer within in the City limits, they do not send sewer flows to the City's system and have their own discharge permit.

Approximately 4% of the service area is developed with institutional and public land. Forsyth County Schools have 7 elementary schools, 2 middle schools and 1 high school located within the City's service area. Additionally, Northside Forsyth Hospital, located near Georgia 400 and Highway 20, is a major water and sewer user.

SECTION V
Water System Model

Water Model and Calibration

The City originally developed a computer model for their water system in 2004. The model was calibrated with the results of several hydrant tests conducted within the service area. The model has been updated as new construction, upgraded water mains and additional fire hydrant flow tests are completed. The most recent update also reflects the current (2021) demand for residential, commercial, and industrial water usage for the City and the water supply to Forsyth County. Improvements in conservation efforts have resulted in lower flows and less stress to the modeled system. The model also includes the City's planned efforts to create separate high-pressure zones for areas of higher elevation that may limit the water supply in other areas of the City.

With several fire flow tests conducted in 2022, the model is under calibration and the results from the model may show higher available pressure and fire flows.

High Pressure Zones and High Elevations

The City is focusing on separating areas of high elevation—defined as areas above 1280 MSL along the Sawnee Mountain ridge—from the rest of the water system. These high elevation areas create high headloss in the system and may limit the distribution of water. By isolating areas of high elevation from the water system with booster pump stations and tanks, the water system can maintain adequate pressure to supply water to developments throughout these areas. The 4 delineated high pressure zones each include a proposed or existing booster pump station. Although several areas outside these defined high pressure zones are above 1280 MSL and may reflect low pressures in the model, these are areas close to existing tanks and have adequate water availability.

Model Demand Distribution

Various junctions in the computer model are designated as nodes for residential, commercial and industrial demand. These nodes were spread throughout the service area based on census tract populations and land use maps. The demand for each category was evenly distributed among the corresponding group of nodes. Table 12 shows the numbers of nodes in each category and the demand placed at each node in the category. The demand from city use and exempt accounts was included in the Commercial category. The demand for irrigation was included in the Residential category. For the model, the demand from Tyson Foods is assumed to increase by 1.5% annually, while the overall industrial demand increase was set at 3% annually.

Table 12 - Computer Model Node AADD Flows

Category	# of Nodes	2021 AADD (MGD)	2021 Flow per Node (GPM)	2040 AADD (MGD)	2040 Flow per Node (GPM)
Residential	140	3.745	18.58	10.296	51.07
Commercial	20	0.899	31.20	2.471	85.79
Industrial	4	0.141	24.52	0.388	67.40
Tyson	1	1.218	845.80	1.471	1,021.82

MDD and MHD conditions were simulated in the model by multiplying the AADD by factors of 1.6 (for MDD) and 2.0 (for MHD). The corresponding flows per node are given in Tables 13 and 14.

Table 13 - Computer Model Node MDD Flows

Category	# of Nodes	2021 MDD (MGD)	2021 Flow per Node (GPM)	2040 MDD (MGD)	2040 Flow per Node (GPM)
Residential	140	5.992	29.72	16.474	81.72
Commercial	20	1.438	49.93	3.953	137.27
Industrial	4	0.226	39.23	0.621	107.85
Tyson	1	1.949	1353.28	2.354	1,634.90

Table 14 - Computer Model Node MHD Flows

Category	# of Nodes	2021 MHD (MGD)	2021 Flow per Node (GPM)	2040 MHD (MGD)	2040 Flow per Node (GPM)
Residential	140	7.490	37.15	20.593	102.15
Commercial	20	1.797	62.41	4.942	171.58
Industrial	4	0.282	49.03	0.776	134.81
Tyson	1	2.436	1691.59	2.943	2043.63

In addition to the demands shown above, the City sells finished water to Forsyth County in several locations. The flows are metered and tabulated monthly. Table 15 gives the flow at each meter for 2021.

Table 15 - 2021 Water Sales to Forsyth County by Meter Location (Gallons)

Location	2021 Total (gallons)	AADD (gpm)	MDD (gpm)	MHD (gpm)
Bonnie Brae	1,685,510	3.21	5.13	10.26
Buford Highway (Cambridge Hills)	1,101,390	2.10	3.35	6.71
Geneva Woods	4,221,700	8.03	12.85	25.70
Old Atlanta Road	410,424,828	780.87	1,249.39	2,498.78
Castleberry Road	22,553,400	42.91	68.66	137.31
Kelly Mill & Bethelview	1,100	0.00	0.00	0.01
Bethelview Road	9,700	0.02	0.03	0.06
Hyde Road	-	-	-	-
Dr. Bramblett Road	265,800	0.51	0.81	1.62
Hammond's Crossing	8,133,018	15.47	24.76	49.52
Pilgrim Mill Road	200	0.00	0.00	0.00
Total	448,396,646	853.11	1,364.98	2,729.96

In the computer model, the flows shown above are described in gallons per minute (gpm) to simulate the water demand for Forsyth County.

High Service Pumps

The high service pumps at the PWPF are operated manually. The Ridge Tank level is monitored and pumps are turned on and off to maintain a tank level between 28 to 35 feet. The computer model matches the total supply from the pumps to the MDD. Pumps #3, #5 and #7 will supply approximately the 2022 MDD. Pumps #3, #4, #5, #6 and #7 will supply approximately the 2040 MDD. Under AADD conditions the tanks would be filling, and under MHD conditions the tanks would be emptying.

Tank Levels

The City's storage tanks operate at an overflow elevation of 1421 MSL. The water plant operators run the high service pumps to maintain a tank level of 28 to 35 feet at the Ridge Tank, corresponding to an HGL of 1414 to 1421 MSL. In the computer model, under AADD, MDD and MHD conditions, tank levels of 1416 MSL are specified for each tank in the system. In the fire flow analysis, specified tank levels of 1401 MSL were used.

SECTION VI
Water Model Results and System Deficiencies

Several scenarios of the city's water system were modeled to determine locations in the Service Area experiencing low pressure and to identify pipes experiencing high head-loss. A summary of each analysis is given below. Generally, the city's system should provide a minimum pressure of 40 psi at all locations within the service area that are at or below elevation 1280 MSL.

Currently, the high service pumps at the City's PWPF operate within the reduced range of 115 to 125 psi discharge pressure due to concerns of higher discharge pressures resulting in older portions of the system failing (primarily old cast iron pipe and/or older PVC pipes). To provide an adequate supply of potable water to outlying areas within the service area and increase system efficiency, the high service pumps should be operating up to 150 psi as originally designed.

A recommended approach for this issue is to provide a balance between operating at a lower system pressure to minimize leaks while implementing an aggressive replacement program for those areas showing the most significant leaks and anticipated older distribution lines.

Existing AADD

Under existing AADD conditions, no junctions in the model located at elevations at or below 1280 MSL experienced pressure below 40 psi. Running the existing system model under AADD conditions also did not reveal any head-loss or velocity concerns within the existing pipe network.

Under existing AADD conditions, several pipes have high head-loss gradients, identifying areas where improvements should be made. The pipes in the following table are representative of the areas where high headloss and/or headloss gradients were found. Several pipes near these also show high headloss gradients but were not listed in the table. A complete list of pipes in the model can be found in the Appendix.

Table 16 - High Headloss Pipes in Existing System at Existing AADD

Pipe	Diameter (in.)	Length (ft)	Location	Head-loss (ft)	Headloss Gradient (ft/ft)	Velocity (ft/s)
P-914	2	2,086	Old Corinth Rd & Mable Lake Rd	34.87	0.01	1.9

Existing MDD

Under existing MDD conditions, no junctions in the model located at elevations at or below 1280 MSL experienced pressure below 40 psi.

In addition to the pipes listed as high headloss gradient pipes in the AADD model (Table 16), the pipes in Table 17 show high head-loss gradients in the MDD model.

Table 17 - High Headloss Pipes in Existing System at Existing MDD

Pipe	Diameter (in.)	Length (ft)	Location	Head-loss (ft)	Headloss Gradient (ft/ft)	Velocity (ft/s)
P-914	2	3,580	Old Corinth Rd & Mable Lake Rd	83.22	0.023	3.04
P-915	2	71	Old Corinth Rd & Mable Lake Rd	5.96	0.084	6.07

Existing MHD

Under existing MHD conditions, no junctions in the model located at elevations at or below 1280 MSL experienced pressure below 40 psi. The pipes in Table 18 show high head-loss gradients in the MHD model.

Table 18 - High Headloss Pipes in Existing System at Existing MHD

Pipe	Diameter (in.)	Length (ft)	Location	Head-loss (ft)	Headloss Gradient (ft/ft)	Velocity (ft/s)
P-914	2	3,580	Old Corinth Rd & Mable Lake Rd	125.81	0.035	3.79
P-915	2	71	Old Corinth Rd & Mable Lake Rd	9.01	0.127	7.59
P-225	2	185	Nuckolls Rd & Buford Dam Rd	4.75	0.026	3.2
U-P-291	8.43	3,468	Hwy 20 & Woodland Hills Dr	3.92	0.001	1.47

Fire Flow at Existing MDD

Under existing MDD conditions, the following locations in the model have an available fire flow at 20 psi less than 1,000 gpm for residential nodes and less than 1,500 gpm for commercial and industrial nodes. The following locations are not necessarily actual fire hydrants. Fire hydrant flow tests in these locations would likely yield higher results than shown in the table below due to the conservative assumptions in the model.

Table 19 - Low Fire Flow Junctions in Existing System at Existing MDD

Node	Available Fire Flow (gpm)	Residual Pressure (psi)	Location	Minimum System Junction
R-5	21.12	21.8	Mable Lake Rd	J-291
R-85	337.81	21.9	Old Corinth Rd	R-5
R-1	554.39	20	Hughes Dr	J-291
R-104	816.88	20	Hwy 20 & Doc Sams Rd	J-291
R-117	888.36	20	Pine Lake Dr & Greenwood Acres Dr	J-291
R-60	917.81	20	Pine Forest Dr	J-291
R-105	954.55	20	Hwy 20 & Lakeside Ln	J-407

The scenario that places the most stress on the existing water system is the available fire flow analysis at MDD conditions. The fire flow scenario reveals the most deficiencies in the system while also including the deficiencies in the MDD and MHD scenarios. Although Table 19 shows 7 locations that are below or near minimum desired available fire flow, the available fire flow at those locations is limited by the residual pressure in only the following locations:

1. R-105/J-407 – Highway 20 west of Tribble Road
2. R-1/J-291 – Sawnee Mountain Tank
3. R-85/R-5 – Mable Lake Road

The low residual pressures from the model for the above locations include conditions of high elevations, small diameter water mains, and dead-ended water mains. The deficiencies found in the existing model are addressed with the proposed improvements to the water system. High elevation areas with low pressure/available fire flow will be improved with proposed booster pump stations in the high-pressure zones. Outside of these zones, high elevations are located close to tanks. For example, at the intersection of Bald Ridge Road and Denson Drive, the high elevation limits the available fire flow in the model. However, this location is located right near the Ridge Tanks, so the junction will have adequate water supply. The limiting factors of dead-end water mains, small diameter water mains will be addressed with proposed increase line sizes and connections throughout the water system. The following locations provide further details for addressing these deficiencies in the system.

Location 1 – Highway 20 at Franklin Goldmine Road
The available fire flow along Highway 20 west is limited due to the dead-end line and relatively high elevations. A few segments have been upgraded to 12-inch from 8-inch along this stretch of road. Upgrading the entire line would increase the available fire flow and be a necessary part of any plan for the development along Hwy 20.

Location 2 – Greenwood Acres Drive and Pine Lake Drive
The high elevations in this area, behind the City's water tanks on Highway 20, are the primary factor for low pressures. The fact that this area is served by older 6 inch water lines also hinders the available fire flow. The 6-inch water lines will ultimately need to be replaced with 8-inch DIP.

The proposed solution is to upgrade the existing water main on Chamblee Gap Road to a 12-inch main from Kelly Mill Road and ultimately extend the 12-inch main to Bethelview Road.

Location 3 – Sanders Road between Highway 20 and Buford Dam Road
Portions of the water main along Sanders Road have been upgraded from 8-inch to 12 inch DIP. Approximately 1,900 LF (1,250 LF near Highway 20 and 650 LF near Buford Dam Road) of 8-inch pipe still needs to be upgraded to 12-inch DIP to complete the line.

Location 4 – 12-inch Connection between Bethelview Road and Castleberry Road
Currently, the City has a 12-inch water main on Bethelview Road that continues through the Silver Leaf Subdivision. The proposed 12-inch DIP water line would run cross-country from Silver Leaf to Castleberry Road. This line would complete the 12-inch line around the perimeter of the City's WSSA in this location.

Location 5 – 16-inch on Highway 9 between Highway 306 and Highway 369
The existing water main on Highway 9 north of Highway 306 to Highway 369 is an older 8 inch cast iron line. The proposed upgrade to a 16-inch line would provide a potential feed to supply water to Dawson County. Additionally, the existing water mains along Spot Road and Gravitt Road in this area are 6-inch lines and should be replaced with 8 inch DIP.

Location 6 – Spot Road from Dr Bramblett Road to Bettis Tribble Gap Road
The water supply from the south along Tribble Gap Road is substantial causing high pressure loss in the existing 8-inch line that runs along Spot Road west to Dr. Bramblett Road. The proposed solution is to upgrade the water line along Spot Road to 12-inch pipe from Dr. Bramblett Road to Tribble Gap Road.

Location 7 – Buford Dam Road from Highway 9 to Market Place Boulevard
Buford Dam Road is one of only four locations where the City's distribution system crosses Georgia 400. The existing 8" carries a large amount of water to the eastern portion of the WSSA. The proposed 12" line will have lower velocities and headloss as development increases in the area.

Location 8 – Samples Road
The existing water main on Samples Road is a combination of 8-inch and 6-inch pipe with one short segment of 12-inch DIP. The existing 6-inch pipe (approximately 9,900 LF) is PVC and should be replaced with 8-inch DIP. The proposed 8-inch line would eliminate a bottleneck in the system and improve system loops in the area.

SECTION VII
Future System Analysis at Future Demands (2040)

As a basis for the future water system, the computer model was updated with the proposed upgrades described above and updated the demands as previously described. In the future system, no junctions experience pressures below 40 psi at AADD, MDD or MHD.

In the fire flow analysis, the available fire flow at 20 psi was at least 1,000 gpm at all residential nodes and 1,500 gpm at all commercial and industrial nodes with the exception of junction I-5. Junction I-5 is located at the extreme western edge of the WSSA on Highway 20 and the estimated available fire flow is 1,492 gpm under MDD conditions.

Proposed Upgrades to meet Intermediate Demands (2040)

In order to prioritize the required system upgrades, the year 2040 was chosen as an intermediate point. The demands in the computer model were adjusted to the values shown in the table below.

Table 20 - Computer Model Node MDD Flows for 2040

Category	2021 Flow per Node (gpm)	2040 Flow per Node (gpm)
Residential	29.72	81.72
Commercial	49.93	137.27
Industrial	39.23	107.85
Tyson	1353.28	1634.90

The fire flow scenario was simulated for the existing system at 2040 MDD conditions to identify the locations with the most inadequate available fire flows. The proposed upgrades were implemented in the model one at a time to address the most glaring system deficiencies until an acceptable level of service was reached. The proposed upgrades in order of priority are listed below.

1. Upgrade water main on Highway 20 to 16-inch DIP entire length to Cherokee County line.
2. Install 12-inch along Chamblee Gap Road from Kelly Mill Road to Hickory Trail

Recommended Improvements for Fire Flow Availability

The City has identified several older subdivisions that do not have fire flow protection or where frequent line breaks are a problem. Many of these subdivisions have undersized PVC or asbestos-cement pipe that has become brittle with age. Upgrading the water lines to DIP and installing fire hydrants would reduce the frequency of breaks and also provide more readily available flow for fire protection. Table 21 provides a summary of each location.

Table 21 - Recommended Water System Upgrades for Increased Fire Flow Availability

Subdivision	Approx. # of Units	Existing Line Size & Material	Approximate LF	Approx. # FH Required
Eagle Creek	323	2" PVC	15,000	17
Lanier Country Club Estates	150	2" & 4" PVC	8,000	10
Timberland Heights	118	2" & 3" PVC	8,600	9
Allendale Drive	29	2" PVC	1,300	2
Mable Lake Road	27	2" PVC	1,500	2
Old Corinth Road	20	2" PVC	1,250	2
Northdale	32	6" PVC	3,600	0
Bald Ridge Acres	45	2" PVC	3,200	5
Punch Hammond Road	55	2" & 3"	4,700	11
Ridge Mill Acres	27	3" PVC	4,150	10
Pine Forest	42	2" & 4"	2,250	7

SECTION VIII
Capital Improvement Recommendations

The following list provides a brief description and opinion of probable cost for all capital improvement projects for the system for the next five years. Projects are listed by the categories of Operations and Maintenance (these are projects required to maintain the city's water system and/or repair or replace an asset), Water System Deficiencies (these are projects required to improve the system before the demand on the asset causes failure or operational and maintenance issues), Water System Improvements (these are projects required to meet future demands on the system). All amounts are based on 2022 dollars estimates.

Existing Elevated Storage

The City's water system operates at an overflow elevation of 1421 MSL and has 6.8 million gallons of elevated water storage in the distribution system. According to Georgia EPD's Minimum Standards for Public Water Systems (March, 2021), the general rule of thumb is to provide the average 24-hour demand in elevated storage. The average daily demand for 2021 was approximately 7.5 million gallons per day, meaning that the City has an elevated storage deficiency of 0.7 million gallons. Additionally, all elevated storage is located on the west side of Georgia 400 while the east and southern portions of the City's Service Area include no elevated storage.

Existing Clearwell Storage

Two clearwells and an older tank located at the PWPF are part of the City's 24-hour demand storage for the water system. These clearwells provide 1.0 MG and a 2.0 MG of storage, and a smaller 42,000-gallon tank. The clearwells were built in 2012. As previously described, the City has a deficiency in finished water storage capacity. The state standard is that clearwell volume be designed and sized to relieve fluctuations in water flow to the filters at the production facility, particularly during peak domestic demands. Standard industry guidelines recommend a clearwell volume of 25% of the daily maximum filter capacity of the plant. According to this recommendation, the City needs a total of at least 6 MG of clearwell volume.

6 MG Clearwell

Construction plans are being developed for a 6.0 MG ground clearwell on the proposed new water plant site next to the existing water plant. The proposed 6.0 MG clearwell would address deficiencies in the finished water storage as it relates to average daily demand as well as clearwell storage deficiencies based on minimum state standards for water treatment plants.

High Pressure Zones Analysis

The City requires that all development located above elevation 1280 MSL include a booster pumping station to provide adequate system pressure to the development. The majority of the locations at high elevations are in the area around Sawnee Mountain. The existing developments consist primarily of dead-end roads extending from major roads up to high elevations. Therefore, this report recommends that each proposed booster station be evaluated on a case by case basis rather than attempting to provide a single high pressure zone.

The following high pressure zone list contains existing booster pumping station:

- Mountain Road
- Hughes Drive

The following high pressure zone list contains proposed booster pumping station:

- Smithdale Heights

Each of the proposed new and upgraded booster pump station will also require upgrades to the existing water lines with the subdivisions. The line sizes will vary depending on the number of connections, desired fire flow and other factors.

The following booster pumping station is in need of improvements:

- Ashebrooke – VFD, storage tanks, etc.
- Nuckolls Road - VFD, storage tanks, etc.

PWPF Deficiencies

In the fall of 2009, The City of Cumming and much of north Georgia experienced extremely high rainfall amounts which resulted in widespread flooding. Water levels in Sawnee Creek on the south side of the clearwells rose to elevations reaching very near the clearwell vents. If creek water entered these vents, the City's drinking water would have been contaminated. Currently, the access road to the PWPF crosses Sawnee Creek, and the creek is conveyed under this crossing by a 60" CMP. Because the flood waters exceeded this pipe's capacity it caused flooding in the area of the clearwells. To ensure safe water and system reliability, the 60" CMP should be removed and replaced with a larger box culvert sized to carry Sawnee Creek flows under flood conditions.

6.0 MGD Booster Pump

In June of 2011, the City investigated the cause for the overflowing of the post flash mixer at the City's 1995 water plant. During the test there were hydraulic problems with the booster pumps making a loud noise followed by a pump shutdown. The suspected cause of the problem was air or possible low suction pressure. In a letter dated June 13, 2011, a list of operational recommendations was developed for the booster pump station.

If in the event a reasonably stable suction pressure for the booster pumps cannot be maintained, this Report recommends construction of a surge tank connecting to the booster pump suction line. This tank would provide a steady, slowly fluctuating supply of water plus be a more effective air release. This Report recommends that the proposed surge tank be 15-feet square and approximately 23-feet high. The top would be 10-feet above the 1995 pre-flash parshall structure.

RWIF Upgrades

Pump Addition

The City's RWIF was designed with dedicated space to accommodate additional pumps. The RWIF has space for eight total pumps. Currently, three spaces are occupied by the County's pumps (#1-450 HP, #6-900 HP, and #8-900 HP), three spaces are occupied by the City's pumps (#2-400 HP, #5-900 HP, #7-900 HP).

The planned 2035 peak day raw water withdrawal for the City and County is a combined 105 MGD based on the MNGWPD Water Supply and Water Conservation Management Plan (70 MGD to the County and 35 MGD to the City). The capacity of the RWIF can be increased by adding pumps and minimal discharge piping. The table below outlines the pump additions for both the City and County and the corresponding RWIF capacity. Pumps #1, #2, #5, #6, #7, and #8 are existing pumps. The pump capacities assume that the City will utilize the existing 42-inch, 30-inch and two 16-inch raw water force mains.

Table 22 - Future RWIF Pump Upgrades and Capacities

City Pumps Used	Total City Pumping Capacity (MGD)	County Pumps Used	Total County Pumping Capacity (MGD)	Total RWIF Pumping Capacity (MGD)
#2 and #5	26	#1 and #6	27	53
#5 and #7	33	#1, #6 and #8	44	77
#2, #5 and #7	37	#1, #6, #8 and #10	59	96
(#9 spare)	37	#1*, #6, #8 and #10	70	107

Pump #2 – Ex. 400 HP, Future 900 HP	Pump #1 – Existing 400 HP, *Future 900 HP
Pump #5 – 900 HP	Pump #6 – 900 HP
Pump #7 – 900 HP	Pump #8 – 900 HP
Pump #9 – 900 HP	Pump #10 – 900 HP

Figure 10 shows the future pump layout and required piping.

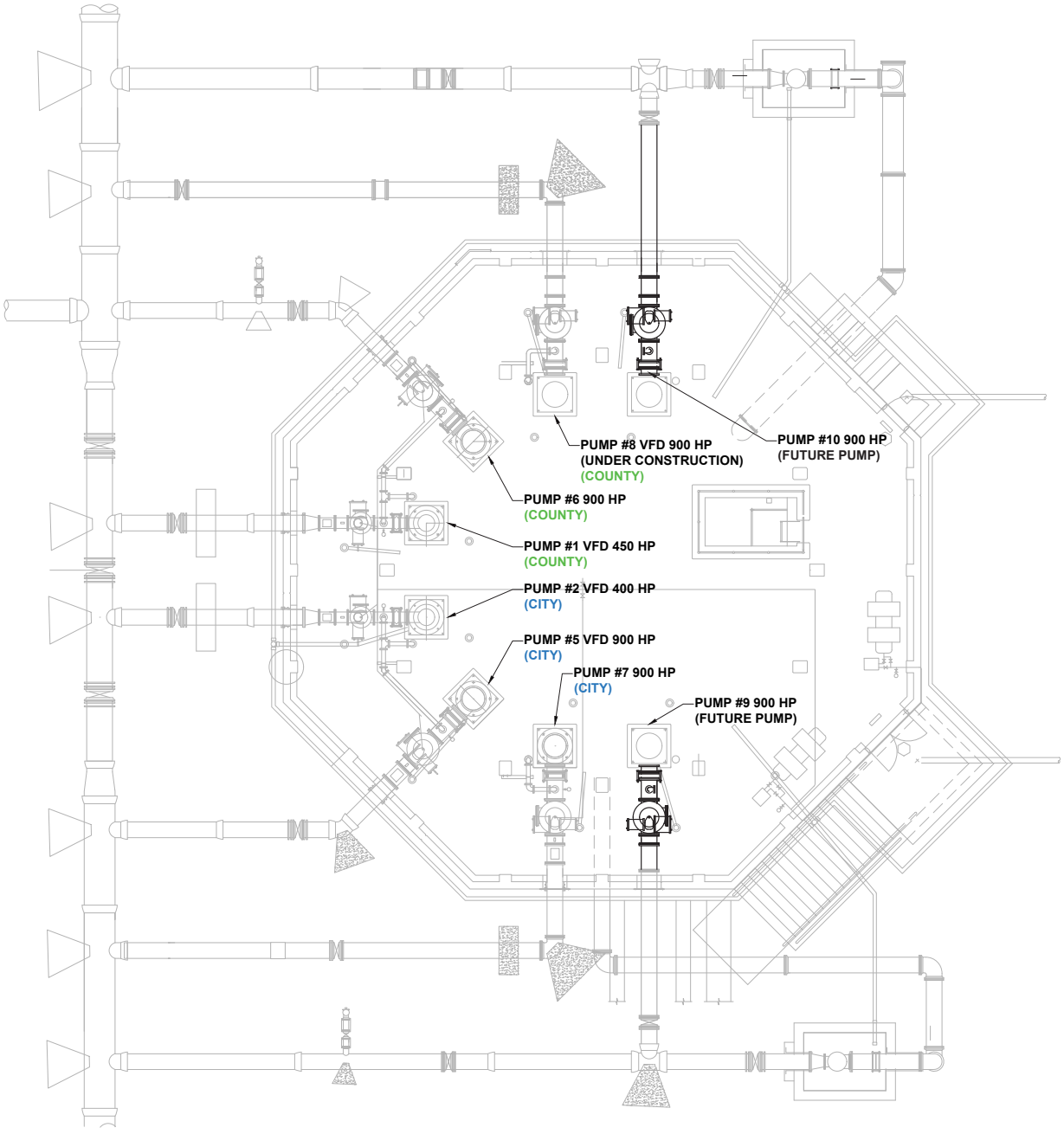


Figure 10 - Future RWIF Pump Configuration and Piping

APPENDIX A
Capital Improvement Plan Projects

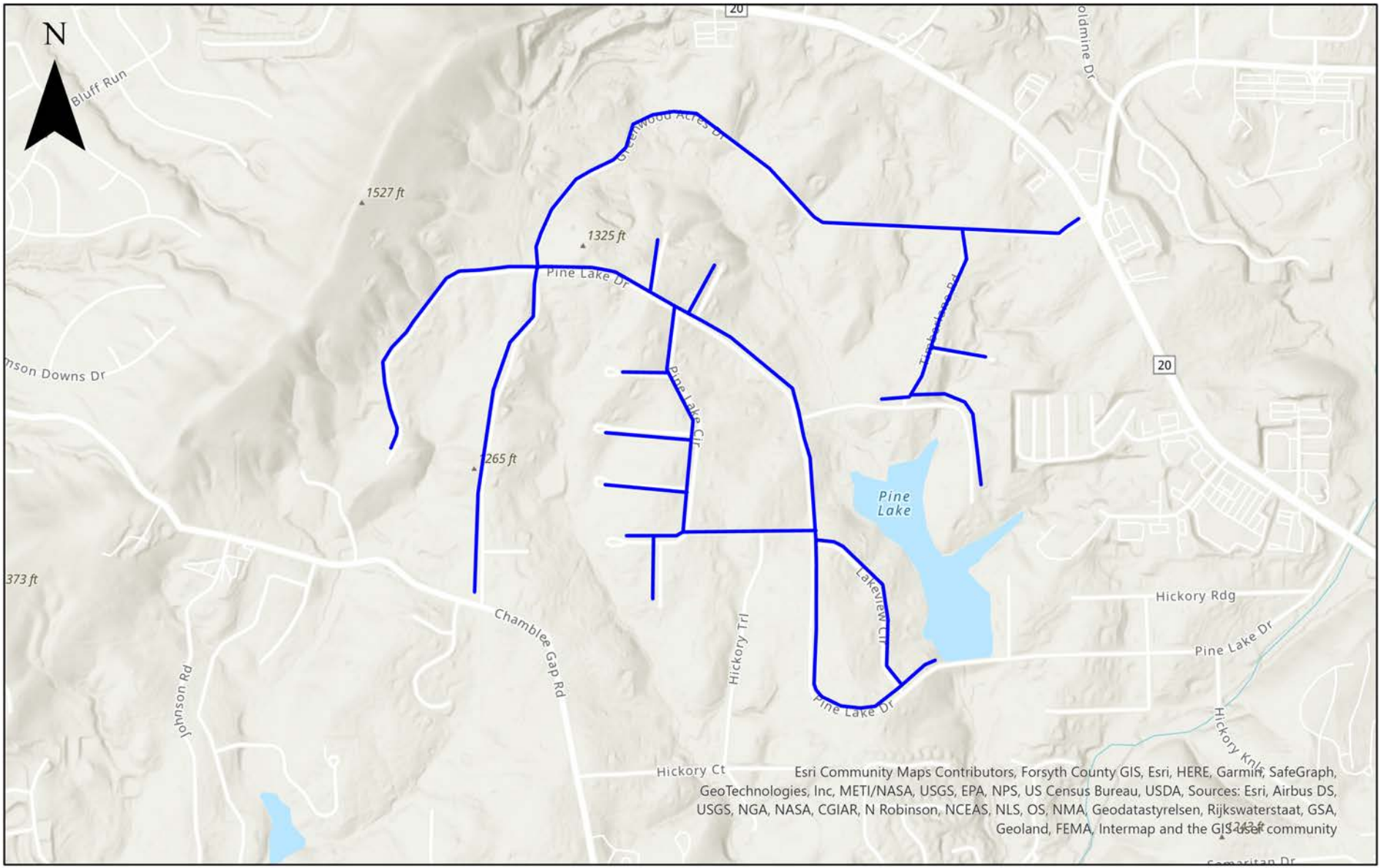
CUMMING UTILITIES

Water Capital Improvement Plan

ITEM	DESCRIPTION	CONSTRUCTION AMOUNT	PRIORITY
1	Greenwood Acres Drive Water Line Replacement	$ 7,023,375.00	2023
2	Highway 20 Water and Sewer Improvements Phase I	$ 22,492,350.00	2023
3	Highway 20 Water and Sewer Improvements Phase II	$ 6,489,975.00	2023
4	Highway 9 Water Line Replacement	$ 9,509,280.00	2023
5	Lake Lanier Water Storage Contract	$ 7,500,000.00	2022
6	2023 PWPF Improvements (36 MGD)	$ 22,500,000.00	2023
7	Sawnee Drive 36-inch Water Main	$ 10,000,000.00	2023
8	Bethelview Road 1.5 MG Water Storage Tank	$ 6,000,000.00	2023
		$ 91,514,980.00	

Estimate 12/22/2022

by Civil Engineering Consultants, Inc.



Legend

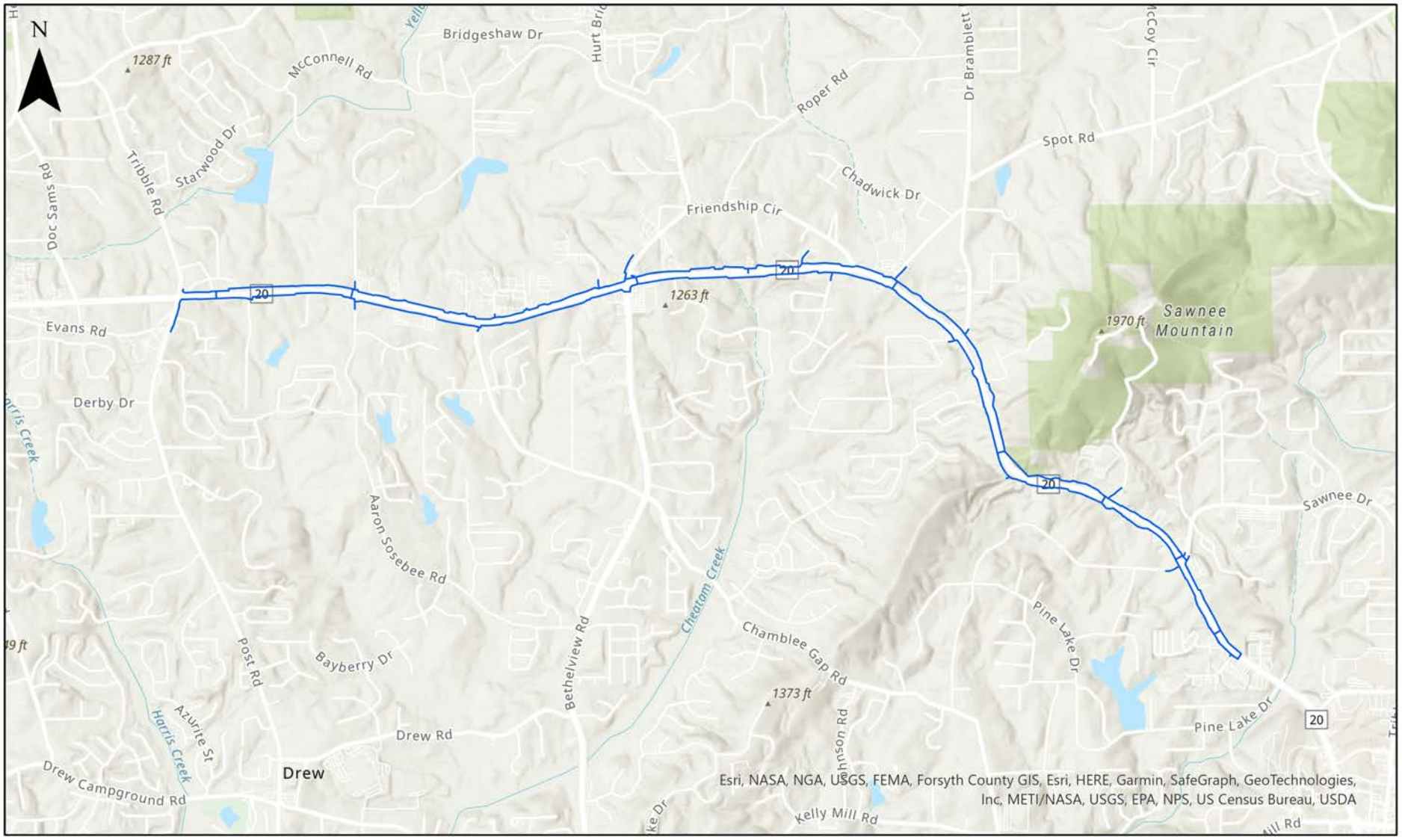
ProposedWaterMainselec

0 250 500 1,000 1,500 2,000 2,500 Feet

CEC
Civil Engineering Consultants, Inc.

Greenwood Acres Drive Water Line Replacement

CUMMING UTILITIES



Legend

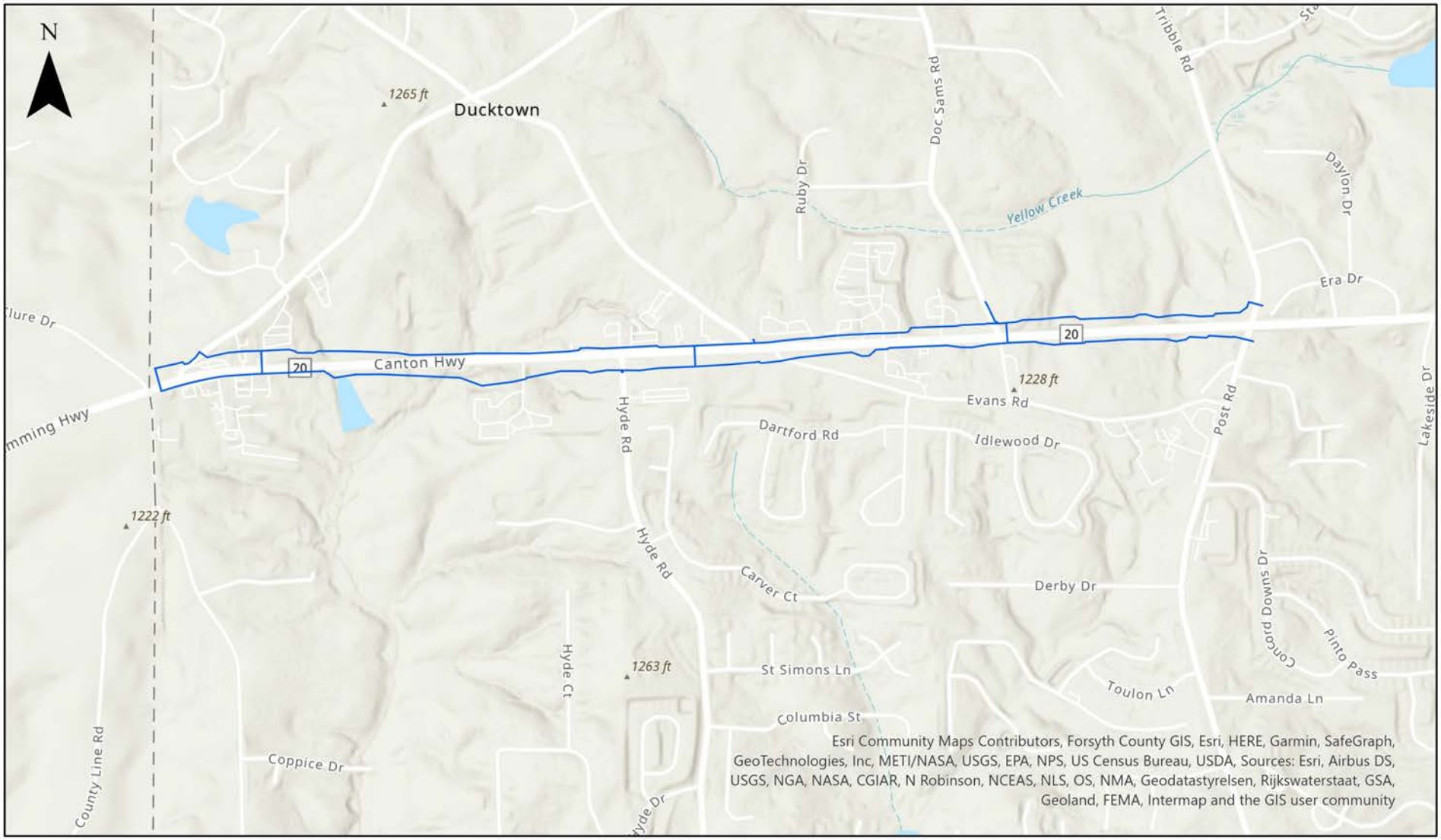
Highway 20 Water and Sewer Phase 1

CEC
CIVIL ENGINEERING CONSULTANTS, INC.

Highway 20 Water and Sewer Improvement Phase I

0 ¼ ½ 1 Miles

CUMMING UTILITIES



Legend

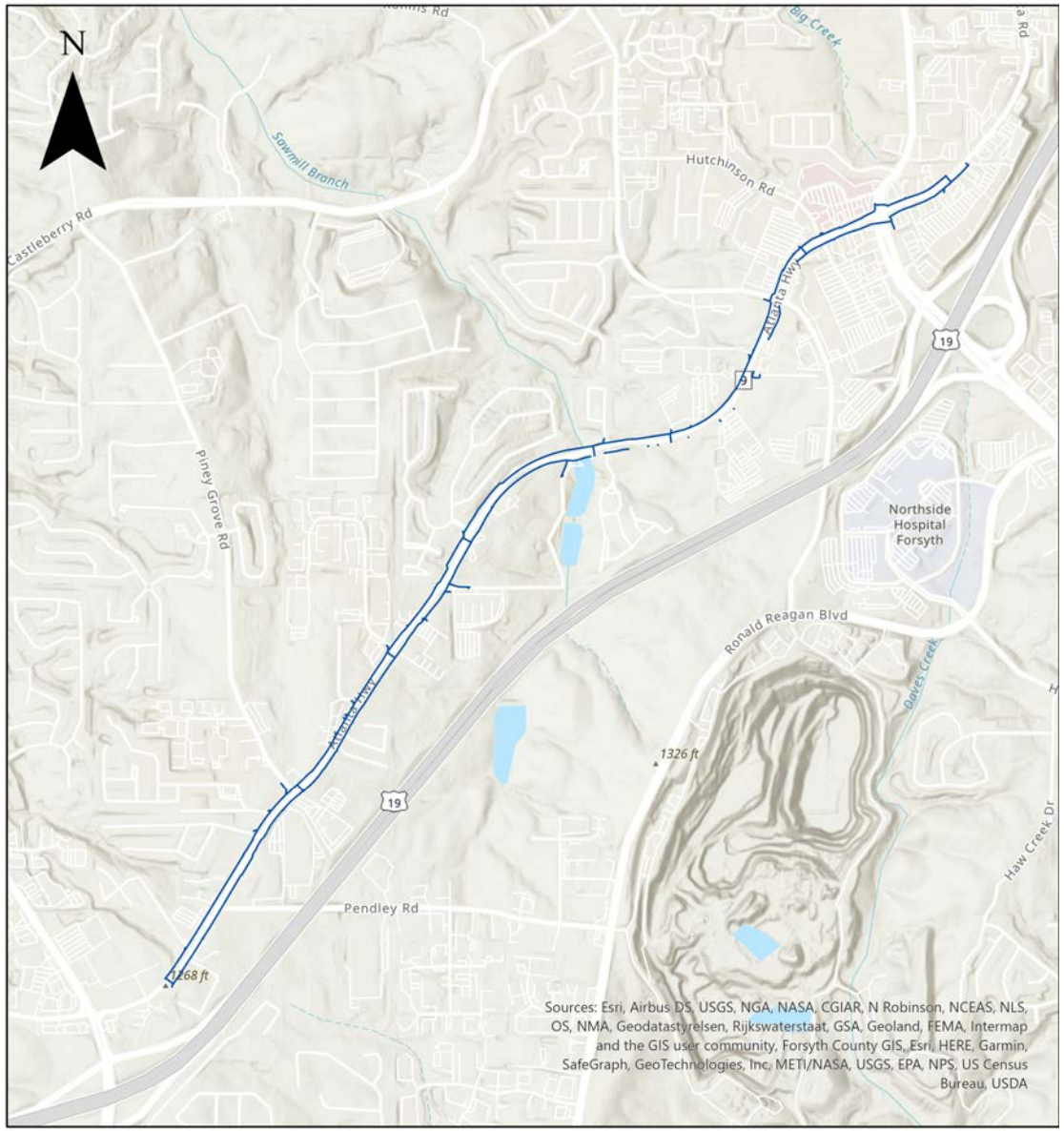
Highway 20 Water and Sewer Phase 2

CEC
Civil Engineering Consultants, Inc.

0 0.13 0.25 0.5 Miles

Highway 20 Water and Sewer Improvement Phase II

CUMMING UTILITIES



Legend

Highway 9 Water Line

0 0.13 0.25 0.5 Miles

Highway 9 Water Line Replacement

CEC
Civil Engineering Consultants, Inc.

CUMMING UTILITIES

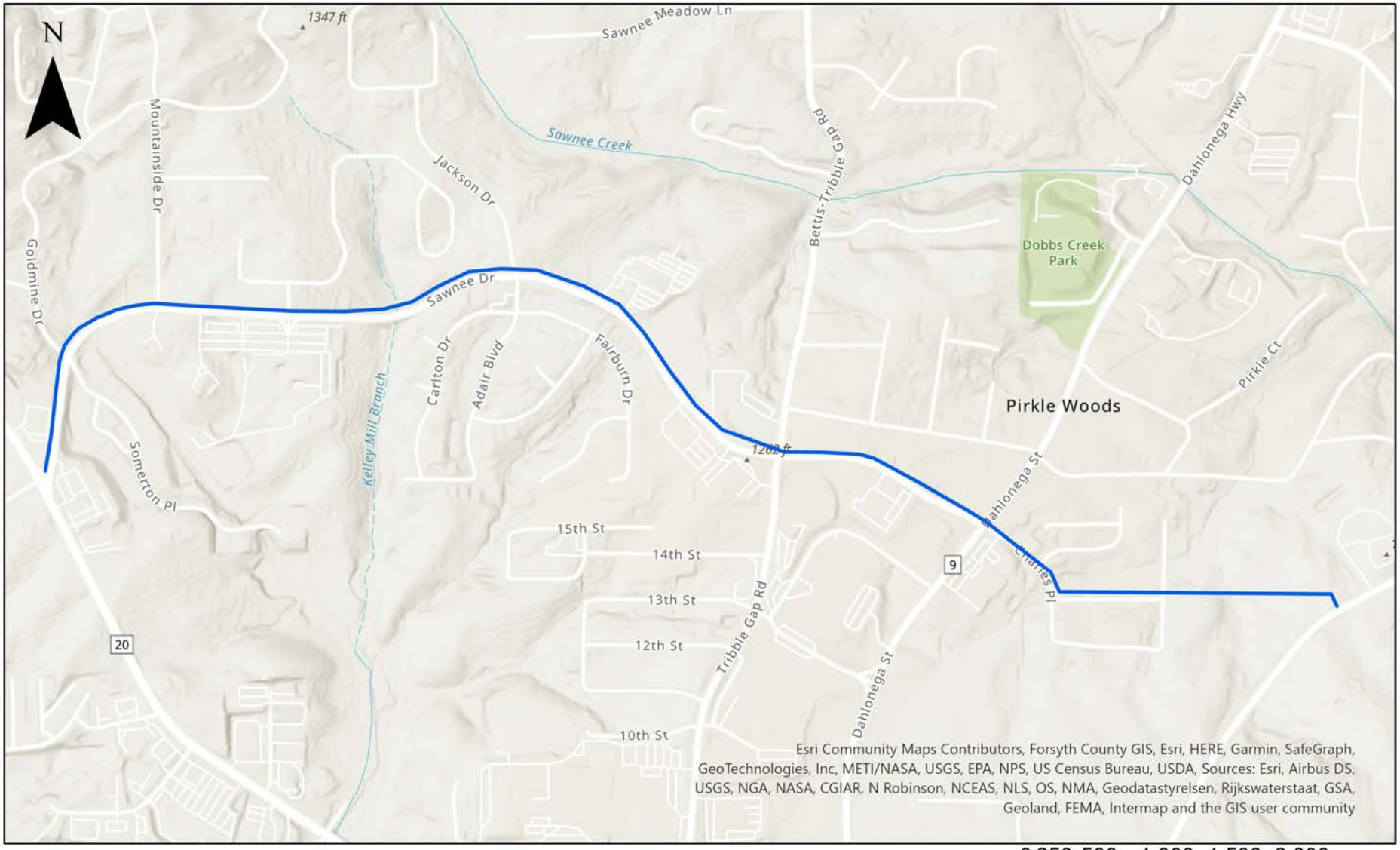
Legend

Water Plant Expansion

2023 PWPF
Improvements
(36 MGD)

CEC
Civil Engineering Consultants, Inc.

CUMMING UTILITIES



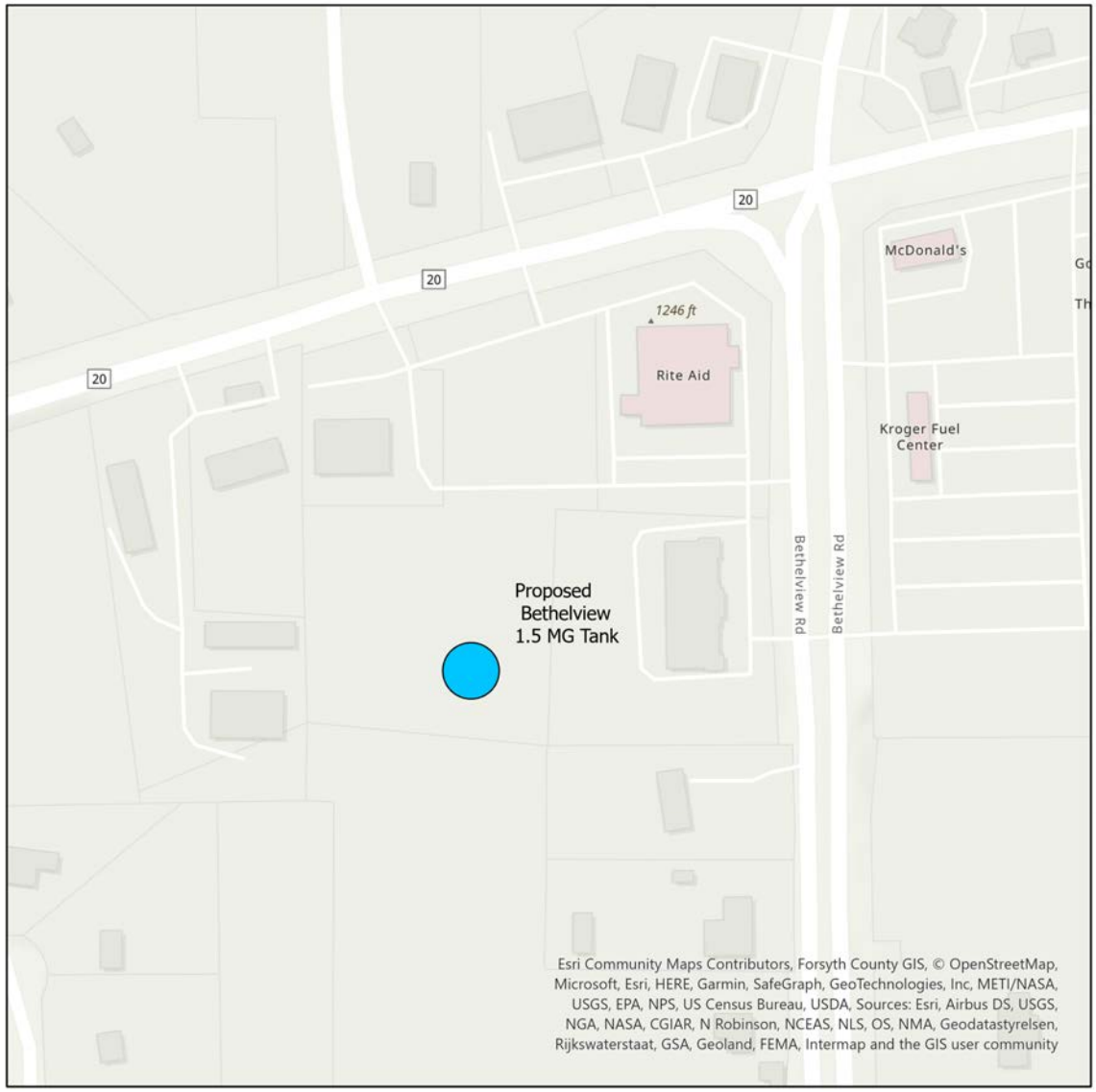
Legend

Proposed 36" Main

Sawnee Drive 36" Water Main

CEC
Civil Engineering Consultants, Inc.

CUMMING UTILITIES



0 75 150 300
US Feet

Legend

Proposed Water Tank

Bethelview Road
1.0 MG Water
Storage Tank

CEC
Civil Engineering Consultants, Inc.

CUMMING UTILITIES

APPENDIX B
WATER SYSTEM INVENTORY

BOOSTER PUMP STATION								
LABEL	NAME	YEAR BUILT / UPGRADE	PUMPS			FEED WATER MAIN DIA.	PRESSURE ZONE	NOTES
			FLOW	TDH	HP			
			(GPM)	(FT)	(HP)	(IN)		
B2	Ashebrooke Booster PS	2012	750	114	30	8	Ashebrooke High Pressure Zone	One Fire Pump
			170	135	10	8	Ashebrooke High Pressure Zone	Two Domestic Pumps
B3	Mountain Road Booster PS	2017	136	255	20	8	Mtn Rd/Hughes Drive High Pressure Zone	Two pumps serving Mountain Rd Ground Tank
B4	Tower Road Booster PS							Private
B5	Wickersham Booster PS	1994	78	108	5	6		
B6	Sawnee Drive Booster PS	2020	136	255	20	8	Sawnee Mountain High Pressure Zone	Two pumps serving Sawnee Drive Ground Tank
B6	Old Smithdale Heights Booster PS	2007						To be replaced

DISTRIBUTION SYSTEM STORAGE FACILITIES							
LABEL	NAME	YEAR BUILT / UPGRADE	STORAGE CAPACITY	OVERFLOW ELEV.	FEED WATER MAIN DIA.	PRESSURE ZONE	NOTES
			(MG)		(IN)		
T1	Elevated Ridge Tank #1	Renovated 2006	1.0	1421.00	12	Main Pressure Zone	
T2	Elevated Ridge Tank #2	Renovated 2006	0.5	1421.00	12	Main Pressure Zone	
T3	Elevated Coal Mountain Tank (State Barn Tank)	Renovated 2021	0.5	1421.00	16	Main Pressure Zone	
T4	Elevated Hendix Rd Tank	Renovated 2021	1.0	1421.00	16	Main Pressure Zone	
T5	Elevated 2.0 MG Northside Hospital Tank	2020	2.0	1421.00	24	Main Pressure Zone	
G1	Sawnee Mountain Ground Tank #1	Renovated 2003	0.8	1421.00	12	Main Pressure Zone	
G2	Sawnee Mountain Ground Tank #2	Renovated 2003	0.5	1421.00	12	Main Pressure Zone	
G3	Hughes Mountain Rd Ground Tank	2017	0.25	1649.00	8	Mtn Rd/Hughes Drive High Pressure Zone	
G4	Sawnee Drive Ground Tank	2020	0.25	1679.00	8	Sawnee Mountain High Pressure Zone	
	TOTAL EXISTING DISTRIBUTION STORAGE		**6.80**				

WATER TREATMENT STORAGE FACILITIES								
LABEL	NAME	YEAR BUILT / UPGRADE	STORAGE CAPACITY	OVERFLOW ELEV.				NOTES
			(MG)					
C1	Clearwell #1		0.14	1142				Backwash
C2	Clearwell #2	1996	1.0	1142				H.S. Pump #3, #4, #5, and backwash pump
C3	Clearwell #3	1996	2.0	1142				H.S. Pump #6 and #7
	TOTAL EXISTING TREATMENT PLANT STORAGE		**3.14**					

SOURCE WATER FACILITIES								
LABEL	NAME	YEAR BUILT / UPGRADE	PUMP CAPACITY	PUMPS				NOTES
				PUMP #	HP	SERVE	PUMP INSTALLATION YEAR	
			(MGD)		(HP)		(FT)	
RWIF 2	Raw Water Intake II	1989	32.0	#3	600	Cumming	1989	Permitted 32 MGD, minimum withdrawal elevation 1405.0Intake II cannot operate at lake levels below 1042 MSL
				#4	600	Cumming	1989	
RWIF 3	Raw Water Intake III	2011	105.0	#1	450 VFD	Forsyth County	2011	Minimum withdrawal elevation 1027.50. Intake III can operate below lake levels of 1035 MSL
				#2	400 VFD	Cumming	2011	
				#5	900 VFD	Cumming	2011	
				#6	900	Forsyth County	2011	
				#7	900	Cumming	2018	
				#8	900	Forsyth County	2022	

WATER TREATMENT FACILITIES								
LABEL	NAME	YEAR BUILT / UPGRADE	TREATMENT CAPACITY	PUMPS				NOTES
				PUMP #	HP	FLOW	TDH	
			(MGD)		(HP)	(GPM)	(FT)	
PWPF	Potable Water Production Facility	1996	18.0	#1				Permitted 18 MGD
				#2				
				#3	350			
				#4	350			
				#5				
				#6	600	6000	330	
				#7	600	6000	330	
PWPF	PWPF Peaking Plant	2009	6.0					Permitted 6 MGD

PLANNED BOOSTER PUMP STATION								
LABEL	NAME	PLANNED YEAR	PUMPS			FEED WATER MAIN		NOTES
			FLOW	TDH	HP	DIA		
			(GPM)	(FT)	(HP)	(IN)		
P-B7	Smithdale Heights Booster PS	2023	220	225	20	8		
P-B8	Lanier Pkwy Booster PS	2023	400	126	20	8		
P-B9	Green Wood Acres Booster PS							

PLANNED STORAGE FACILITIES								
LABEL	NAME	PLANNED YEAR	STORAGE CAPACITY	OVERFLOW ELEV.				CONVEYANCE AND NOTES
			(MG)					
P-G5	Green Wood Acres Ground Tank		0.25					
P-T6	Lanier Pkwy Elevated Tank	2023	0.25	1521				
P-G7	Smithdale Heights Ground Tank	2023	0.25	1610				
P-T8	Bethelview Road 1.5 MG Tank	2023	1.5	1421				
P-C4	Clearwell #4	2023	6.0	1216				
P-C5	Clearwell #5		6.0	1216				
		TOTAL PLANNED STORAGE	14.00					

PLANNED TREATMENT FACILITIES								
LABEL	NAME	PLANNED YEAR	TREATMENT CAPACITY					CONVEYANCE AND NOTES
			(MGD)					
P-PWPF	Potable Water Production Facility		18.0					The new plant will be next to the existing plant.
P-PWPF	PWPF Peaking Plant	2023	12.0					Install membrane filtration to upgrade from 6.0 to 12.0 MGD.

APPENDIX C
WATER MODEL DATA

Hydraulic Model Inventory: Cumming Water Model 2022.wtg

Title	
Engineer	
Company	
Date	11/29/2022
Notes	

Scenario Summary

ID	88
Label	Ex System - Ex Average Day
Notes	
Active Topology	Base-Active Topology
Physical	Base-Physical
Demand	Base-Demand
Initial Settings	Base-Initial Settings
Operational	Base-Operational
Age	Base-Age Alternative
Constituent	Base-Constituent
Trace	Base-Trace Alternative
Fire Flow	Base-Fire Flow
Energy Cost	Base-Energy Cost
Transient	Base Transient
Pressure Dependent Demand	Base Pressure Dependent Demand
Failure History	Base Failure History
SCADA	Base SCADA
User Data Extensions	Base-User Data
Steady State/EPS Solver Calculation Options	Ex System - Ex Average Day
Transient Solver Calculation Options	Base Calculation Options

Network Inventory

Pipes	898	-Standard Extended	0
Laterals	0	<None>	2
Junctions	767	-Constant Speed - Four-Quadrant Characteristics	7
Hydrants	7	-Constant Speed - Pump Definition	2
Tanks	8	-Shut Down After Time Delay	0
-Circular	8	-Variable Speed/Torque	0
-Non-Circular	0	-Pump Start - Variable Speed/Torque	0
-Variable Area	0	Pump Stations	0
Reservoirs	3	Variable Speed Pump Batteries	0
Customer Meters	0	PRV's	0
Taps	0	PSV's	0
SCADA Elements	0	PBV's	0
Pumps	9	FCV's	0
-Constant Power	0	TCV's	0
-Custom Extended	0	GPV's	0
-Design Point (1 Point)	1	Isolation Valves	0
-Multiple Point	7	Spot Elevations	0
-Standard (3 Point)	1		

Hydraulic Model Inventory: Cumming Water Model 2022_LH.wtg

Network Inventory

Transient Network Inventory

Turbines	0	Rupture Disks	0
Periodic Head-Flows	0	Discharges to Atmosphere	0
Air Valves	0	Orifices Between Pipes	0
Hydropneumatic Tanks	0	Valves With Linear Area Change	0
Surge Valves	0	Surge Tanks	0
Check Valves	0		

Pressure Pipes Inventory

2.00 (in)	8,471 ft	12.00 (in)	164 ft
3.00 (in)	1 ft	12.51 (in)	293,305 ft
5.74 (in)	1,800 ft	12.52 (in)	18,045 ft
6.00 (in)	10 ft	14.00 (in)	76 ft
6.09 (in)	11,713 ft	14.94 (in)	4,045 ft
6.28 (in)	115,516 ft	16.59 (in)	59,080 ft
7.80 (in)	28,802 ft	18.65 (in)	24,017 ft
7.94 (in)	4,430 ft	24.52 (in)	11 ft
7.98 (in)	1,742 ft	24.82 (in)	6,751 ft
8.43 (in)	182,035 ft	24.95 (in)	180 ft
9.79 (in)	329 ft	29.00 (in)	3 ft
10.46 (in)	9,791 ft	30.90 (in)	2,688 ft
11.57 (in)	770 ft	36.93 (in)	967 ft
11.89 (in)	2,383 ft	37.10 (in)	15 ft
11.89 (in)	756 ft	37.21 (in)	25,120 ft
11.94 (in)	739 ft	All Diameters	803,755 ft

APPENDIX D
SERVICE DELIVERY STRATEGY

Georgia Department of Community Affairs

SERVICE DELIVERY STRATEGY

FORM 2: Summary of Service Delivery Arrangements

Instructions:

Make copies of this form and complete one for each service listed on FORM 1, Section III. Use exactly the same service names listed on FORM 1. Answer each question below, attaching additional pages as necessary. If the contact person for this service (listed at the bottom of the page) changes, this should be reported to the Department of Community Affairs.

COUNTY:FORSYTH COUNTY	Service:*SOIL EROSION PERMITTING AND ENFORCEMENT*

1. Check the box that best describes the agreed upon delivery arrangement for this service:

☐ Service will be provided countywide (i.e., including all cities and unincorporated areas) by a single service provider. (If this box is checked, identify the government, authority or organization providing the service.):

☐Service will be provided only in the unincorporated portion of the county by a single service provider. (If this box is checked, identify the government, authority or organization providing the service.):

☐One or more cities will provide this service only within their incorporated boundaries, and the service will not be provided in unincorporated areas. (If this box is checked, identify the government(s), authority or organization providing the service:

☒One or more cities will provide this service only within their incorporated boundaries, and the county will provide the service in unincorporated areas. (If this box is checked, identify the government(s), authority or organization providing the service.): **CITY OF CUMMING AND FORSYTH COUNTY**

☐Other (If this box is checked, **attach a legible map delineating the service area of each service provider,** and identify the government, authority, or other organization that will provide service within each service area.):

2. In developing this strategy, were overlapping service areas, unnecessary competition and/or duplication of this service identified?

☐***Yes*** (if "Yes," you must attach additional documentation as described, below)

☒***No***

If these conditions will continue under this strategy, **attach an explanation for continuing the arrangement** (i.e., overlapping but higher levels of service (See O.C.G.A. 36-70-24(1)), overriding benefits of the duplication, or reasons that overlapping service areas or competition cannot be eliminated).

If these conditions will be eliminated under the strategy, **attach an implementation schedule** listing each step or action that will be taken to eliminate them, the responsible party and the agreed upon deadline for completing it.

Page 1 of 2

SDS FORM 2, continued

3. List each government or authority that will help to pay for this service and indicate how the service will be funded (e.g., enterprise funds, user fees, general funds, special service district revenues, hotel/motel taxes, franchise taxes, impact fees, bonded indebtedness, etc.).

Local Government or Authority	*Funding Method*
CITY OF CUMMING	General Fund
CITY OF CUMMING	User Fees
FORSYTH COUNTY	General Fund
FORSYTH COUNTY	User Fees
FORSYTH COUNTY	Insurance Premium Tax Fund
FORSYTH COUNTY	NCRS Soil Conservation Fund

4. How will the strategy change the previous arrangements for providing and/or funding this service within the county?

5. List any formal service delivery agreements or intergovernmental contracts that will be used to implement the strategy for this service:

Agreement Name	*Contracting Parties*	*Effective and Ending Dates*

6. What other mechanisms (if any) will be used to implement the strategy for this service (e.g., ordinances, resolutions, local acts of the General Assembly, rate or fee changes, etc.), and when will they take effect?

Forsyth County Soil Erosion and Sediment Control Ordinance

7. Person completing form: **Vanessa Bernstein, Forsyth County Senior Planner**
Phone number: **678-513-5866** Date completed: 10/25/2012

8. Is this the person who should be contacted by state agencies when evaluating whether proposed local government projects are consistent with the service delivery strategy? ☒Yes ☐No

If not, provide designated contact person(s) and phone number(s) below:

Page 2 of 2

Soil Erosion Permitting and Enforcement Service Delivery Strategies
City of Cumming and Forsyth County

Forsyth County offers this service through the Forsyth County Planning and Community Development Department and Department of Engineering. Any project requiring land disturbing activities is also reviewed by the Natural Resources Conservation Service according to Forsyth County development regulations and state laws, before a land disturbance permit (LDP) is issued. Enforcement is accomplished through regular scheduled inspections, inclement weather inspections and citizen complaint follow-up in the unincorporated areas of Forsyth County.

The City of Cumming offers the same type service through the Cumming Planning and Zoning Department. Any project requiring land disturbing activities are reviewed by the Natural Resources Conservation Service and the City Planning Department according to City of Cumming development regulations and state laws before a land disturbance permit (LDP)is issued. Enforcement is accomplished through regular scheduled inspections, inclement weather inspections and citizen complaint follow-up in the areas inside the city limits of Cumming.

Each entity's department provides service to their respective constituents while lending assistance to one another in this area whenever necessary.

City of Cumming Mayor
Date: 10-30-12

Forsyth County Chairman
Date: 10/29/12

Solid Waste Management Service Delivery Strategies
City of Cumming and Forsyth County

Garbage pick-up service is provided solely by the City of Cumming and only to the constituents located in the city's corporate limits. Monthly charges for service appear on the user's water bill. The fees are calculated to offset cost of collection and disposal.

Service outside the city's corporate limits, under the jurisdiction of Forsyth County, is delivered by private contractors who deal directly with the constituent requesting this service. In addition, the county operates convenient centers for trash and recycling drop off for City of Cumming and Forsyth County residents.

City of Cumming Mayor

Date: 10-30-12

Forsyth County Chairman

Date: 10/29/12

SDS FORM 2, continued

3. List each government or authority that will help to pay for this service and indicate how the service will be funded (e.g., enterprise funds, user fees, general funds, special service district revenues, hotel/motel taxes, franchise taxes, impact fees, bonded indebtedness, etc.).

Local Government or Authority	*Funding Method*
CITY OF CUMMING	General Fund
CITY OF CUMMING	Utilities Department Budget
FORSYTH COUNTY	General Fund
FORSYTH COUNTY	Insurance Premium Tax Fund

4. How will the strategy change the previous arrangements for providing and/or funding this service within the county?

5. List any formal service delivery agreements or intergovernmental contracts that will be used to implement the strategy for this service:

Agreement Name	*Contracting Parties*	*Effective and Ending Dates*

6. What other mechanisms (if any) will be used to implement the strategy for this service (e.g., ordinances, resolutions, local acts of the General Assembly, rate or fee changes, etc.), and when will they take effect?

Forsyth County Storm Water Management Ordinance

7. Person completing form: **Vanessa Bernstein, Forsyth County Senior Planner**
Phone number: **678-513-5866** Date completed: 10/25/2012

8. Is this the person who should be contacted by state agencies when evaluating whether proposed local government projects are consistent with the service delivery strategy? ☒Yes ☐No

If not, provide designated contact person(s) and phone number(s) below:

Storm Water Management Service Delivery Strategies
City of Cumming and Forsyth County

Forsyth County offers this service through the Forsyth County Department of Engineering. Storm water management is reviewed, planned and inspected in accordance with Forsyth County development regulations and state laws within the unincorporated areas of Forsyth County.

The City of Cumming offers the same type service through the Departments of Planning and Zoning and Utilities. Storm water management is reviewed, planned and inspected in accordance with the City of Cumming development regulations, Utilities Ordinance and all applicable state laws within the city limits of Cumming.

Each entity's department provides this service to their respective constituents while lending assistance to one another in this area whenever necessary.

City of Cumming Mayor

Date: 10-30-12

Forsyth County Chairman

Date: 10/29/12

Georgia Department of Community Affairs

SERVICE DELIVERY STRATEGY

FORM 2: Summary of Service Delivery Arrangements

Instructions:

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COUNTY:FORSYTH COUNTY	Service:*TRANSPORTATION*

1. Check the box that best describes the agreed upon delivery arrangement for this service:

☐ Service will be provided countywide (i.e., including all cities and unincorporated areas) by a single service provider. (If this box is checked, identify the government, authority or organization providing the service.):

☐Service will be provided only in the unincorporated portion of the county by a single service provider. (If this box is checked, identify the government, authority or organization providing the service.):

☐One or more cities will provide this service only within their incorporated boundaries, and the service will not be provided in unincorporated areas. (If this box is checked, identify the government(s), authority or organization providing the service:

☒One or more cities will provide this service only within their incorporated boundaries, and the county will provide the service in unincorporated areas. (If this box is checked, identify the government(s), authority or organization providing the service.): **CITY OF CUMMING AND FORSYTH COUNTY EXCEPT FOR DIAL-A-RIDE SERVICE, WHICH IS COUNTY-WIDE PROVIDED BY FORSYTH COUNTY**

☐Other (If this box is checked, **attach a legible map delineating the service area of each service provider,** and identify the government, authority, or other organization that will provide service within each service area.):

2. In developing this strategy, were overlapping service areas, unnecessary competition and/or duplication of this service identified?

☐***Yes*** (if "Yes," you must attach additional documentation as described, below)

☒***No***

If these conditions will continue under this strategy, **attach an explanation for continuing the arrangement** (i.e., overlapping but higher levels of service (See O.C.G.A. 36-70-24(1)), overriding benefits of the duplication, or reasons that overlapping service areas or competition cannot be eliminated).

If these conditions will be eliminated under the strategy, **attach an implementation schedule** listing each step or action that will be taken to eliminate them, the responsible party and the agreed upon deadline for completing it.

SDS FORM 2, continued

3. List each government or authority that will help to pay for this service and indicate how the service will be funded (e.g., enterprise funds, user fees, general funds, special service district revenues, hotel/motel taxes, franchise taxes, impact fees, bonded indebtedness, etc.).

Local Government or Authority	*Funding Method*
CITY OF CUMMING	General Fund
CITY OF CUMMING	SPLOST
FORSYTH COUNTY	General Fund and Insurance Premium Tax Fund
FORSYTH COUNTY	SPLOST
FORSYTH COUNTY	User Fees, Grants and the General Fund for Dial-A-Ride Service
	State and federal aid for both jurisdictions

4. How will the strategy change the previous arrangements for providing and/or funding this service within the county?

5. List any formal service delivery agreements or intergovernmental contracts that will be used to implement the strategy for this service:

Agreement Name	*Contracting Parties*	*Effective and Ending Dates*

6. What other mechanisms (if any) will be used to implement the strategy for this service (e.g., ordinances, resolutions, local acts of the General Assembly, rate or fee changes, etc.), and when will they take effect?

7. Person completing form: **Vanessa Bernstein, Forsyth County Senior Planner**
Phone number: **678-513-5866** Date completed: 10/25/2012

8. Is this the person who should be contacted by state agencies when evaluating whether proposed local government projects are consistent with the service delivery strategy? ☒Yes ☐No

If not, provide designated contact person(s) and phone number(s) below:

Transportation Service Delivery Strategies
City of Cumming and Forsyth County

Forsyth County offers services related to transportation through its Engineering Department and the Dial-A-Ride program. The Roads and Bridges Division of the Engineering Department maintains roadways including corresponding bridges and rights-of-way outside the city limits of Cumming. The Traffic Division installs and maintains traffic signalizations, school beacons, lighted crosswalks and traffic signs on county roads. The remaining signalization locations are maintained by the City of Cumming and surrounding jurisdictions with the Georgia Department of Transportation being responsible for all signals located on state routes. The Engineering Division manages county road improvement and utility projects, rights-of-way acquisitions, the SPLOST transportation program and performs review and inspection services related to the installation of infrastructure for new and expanding developments.

The City of Cumming offers the same type service through its Street Department inside the city limits.

In instances of emergency weather conditions, Forsyth County may assist the City of Cumming through the use of emergency road equipment as needs arise and such equipment is available.

Dial-A-Ride is operated as a public transportation program through the Forsyth County Fleet Services Department within Forsyth County and the City of Cumming.

City of Cumming Mayor
Date: 10-30-12

Forsyth County Chairman
Date: 10/29/12

Georgia Department of Community Affairs

SERVICE DELIVERY STRATEGY

FORM 2: Summary of Service Delivery Arrangements

Instructions:

Make copies of this form and complete one for each service listed on FORM 1, Section III. Use exactly the same service names listed on FORM 1. Answer each question below, attaching additional pages as necessary. If the contact person for this service (listed at the bottom of the page) changes, this should be reported to the Department of Community Affairs.

COUNTY:FORSYTH COUNTY	Service:*WATER AND WASTEWATER*

1. Check the box that best describes the agreed upon delivery arrangement for this service:

☐ Service will be provided countywide (i.e., including all cities and unincorporated areas) by a single service provider. (If this box is checked, identify the government, authority or organization providing the service.):

☐Service will be provided only in the unincorporated portion of the county by a single service provider. (If this box is checked, identify the government, authority or organization providing the service.):

☐One or more cities will provide this service only within their incorporated boundaries, and the service will not be provided in unincorporated areas. (If this box is checked, identify the government(s), authority or organization providing the service:

☐One or more cities will provide this service only within their incorporated boundaries, and the county will provide the service in unincorporated areas. (If this box is checked, identify the government(s), authority or organization providing the service.):

☒Other (If this box is checked, **attach a legible map delineating the service area of each service provider,** and identify the government, authority, or other organization that will provide service within each service area.): **CITY OF CUMMING AND FORSYTH COUNTY**

2. In developing this strategy, were overlapping service areas, unnecessary competition and/or duplication of this service identified?

☐***Yes*** (if "Yes," you must attach additional documentation as described, below)

☒***No***

If these conditions will continue under this strategy, **attach an explanation for continuing the arrangement** (i.e., overlapping but higher levels of service (See O.C.G.A. 36-70-24(1)), overriding benefits of the duplication, or reasons that overlapping service areas or competition cannot be eliminated).

If these conditions will be eliminated under the strategy, **attach an implementation schedule** listing each step or action that will be taken to eliminate them, the responsible party and the agreed upon deadline for completing it.

Page 1 of 2

SDS FORM 2, continued

3. List each government or authority that will help to pay for this service and indicate how the service will be funded (e.g., enterprise funds, user fees, general funds, special service district revenues, hotel/motel taxes, franchise taxes, impact fees, bonded indebtedness, etc.).

Local Government or Authority	*Funding Method*
CITY OF CUMMING	User Fees
FORSYTH COUNTY	User Fees

4. How will the strategy change the previous arrangements for providing and/or funding this service within the county?

5. List any formal service delivery agreements or intergovernmental contracts that will be used to implement the strategy for this service:

Agreement Name	*Contracting Parties*	*Effective and Ending Dates*
Water & Sewer Boundaries	City of Cumming and Forsyth County	6/1/87 - no end specified
Raw & Finished Water	City of Cumming and Forsyth County	11/01/12 - 10/31/22
		Extension possible to 2042

6. What other mechanisms (if any) will be used to implement the strategy for this service (e.g., ordinances, resolutions, local acts of the General Assembly, rate or fee changes, etc.), and when will they take effect?

7. Person completing form: **Vanessa Bernstein, Forsyth County Senior Planner**
Phone number: **678-513-5866** Date completed: 10/25/2012

8. Is this the person who should be contacted by state agencies when evaluating whether proposed local government projects are consistent with the service delivery strategy? ☒Yes ☐No

If not, provide designated contact person(s) and phone number(s) below:

Page 2 of 2

Water and Wastewater Service Delivery Strategies
City of Cumming and Forsyth County

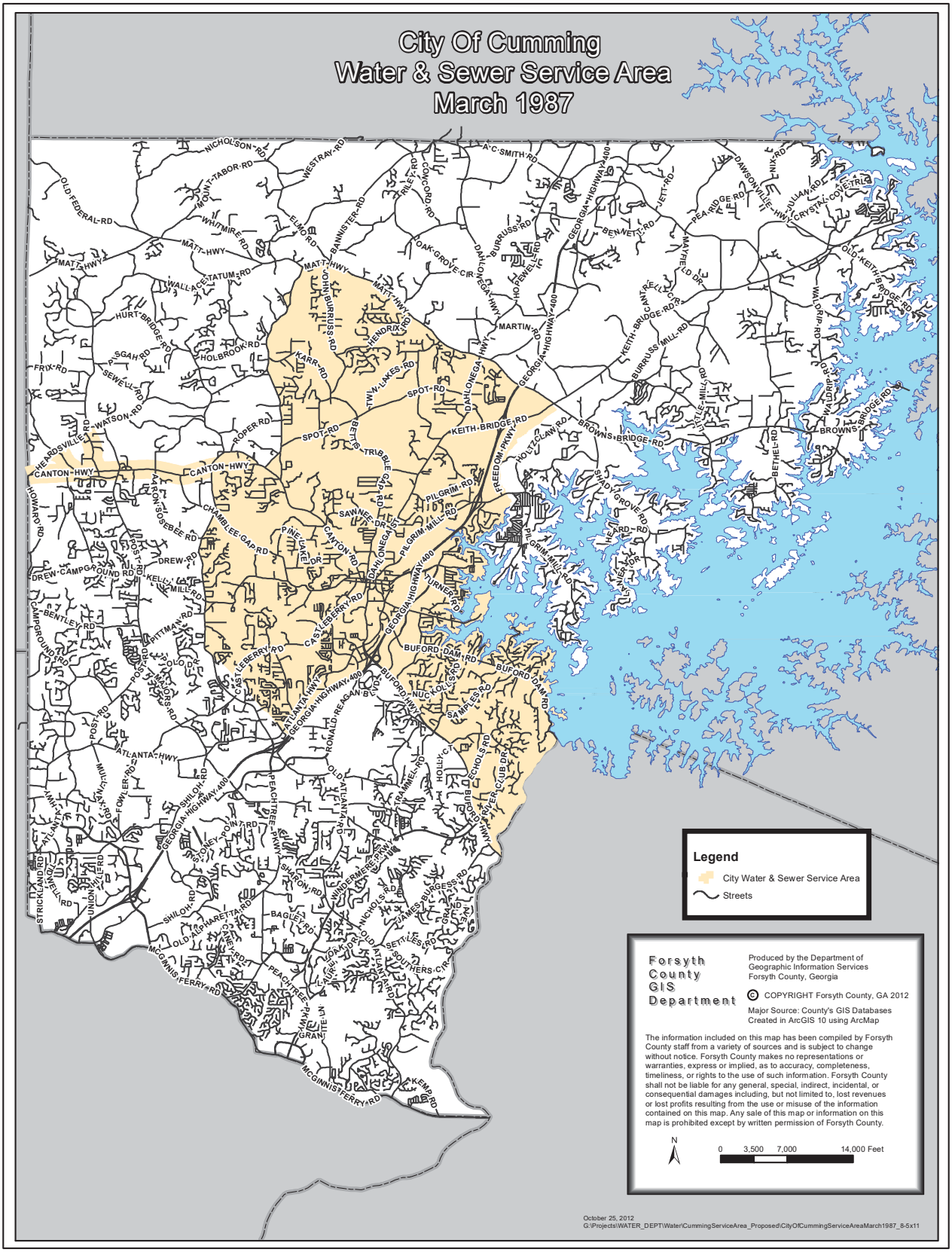
Forsyth County and the City of Cumming each have water and wastewater treatment facilities, distribution and collection systems to serve their respective service areas. On October 26, 2012, the city and county entered into a new intergovernmental agreement related to the provision of raw and finished water. In addition to establishing pricing, the agreement also addressed the city and county water boundary. The 1987 sewer boundary agreement will control until modified.

City of Cumming Mayor

Date: 10-30-12

Forsyth County Chairman

Date: 10/29/12


City Of Cumming
Water & Sewer Service Area
March 1987
Legend
City Water & Sewer Service Area
Streets
Forsyth County GIS Department
Produced by the Department of Geographic Information Services Forsyth County, Georgia
COPYRIGHT Forsyth County, GA 2012
Major Source: County's GIS Databases
Created in ArcGIS 10 using ArcMap
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ADDENDUM TO MEMORANDUM OF AGREEMENT EXECUTED THE 27th DAY OF FEBRUARY, 1987 BY FORSYTH COUNTY BOARD OF COMMISSIONERS, MAYOR AND COUNCIL - CITY OF CUMMING

In an effort to facilitate and implement the water agreement between the two governing authorities, we would like at this time to present for your consideration and validation the following areas of agreement concerning the boundaries between the two governmental entities.

(1) Highway 20 East of Cumming. In the areas that are to be served by Forsyth County on Highway 20, the county will have the right to establish a meter at any major road intersection on the South side of the road that is to be served by the county. If a new development is established on the South side of Highway 20 East and a road will be developed to serve this development, then a master meter will be installed by the County to serve this development. Any single family residence or business that is tapped on to the line on either side of Highway 20 East will be served by the city on this line, and at no time will the county enter into the establishment of single family metering on Highway 20 East.

(2) Highway 20 West of Cumming. A master meter can be established by the County at any of the major road intersections either north or south of Highway 20 West with the exception of the intersections of Doc Sams Road, Franklin Gold Mine, Friendship Circle, Spot Road Connector and Spot Road with Highway 20 West. These are presently served by the city and will continue to be served by the city. At any other intersection, or with the development of a piece of property, a master meter may be established at any of such points by the County. A master meter should be installed by the County at the County Line and come up Heardsville Road to intersect with Gold Mine and Doc Sams Roads in order to establish the loop, and from that point the county will go forward with any development it wishes in the way of water lines.

(3) Bethelview Road. At the intersection of Bethelview Road a master meter will be established by the County to run the water line down Bethelview Road.

The city may establish a master meter at any intersection on their territorial (eastern) side but all single family residence or business will be serviced by the county, whether now in service or later tapped on.

(4) Doc Bramblett Road and Spot Road. The city has an 8 inch line at the intersection of Doc Bramblett Road and Spot Road. At this point the county will establish a master meter and run north with a 12 inch line. The same format will be established in this territory as is on Bethelview Road, with the city's jurisdiction being east of Doc Bramblett Road. The line will continue to Highway 369. At this point a 12 inch line will be installed by the county from the intersection of Doc Bramblett Road and 369 East to Southeasterly to Highway 9 (SR 9), at which point engineering consideration will be determined as to how the lines can be inter-connected.

(5) Highway 369 & 400. At the end of the county's line at 369 and the Dinner Deck or 400, a line will be run by the County from there to Six Mile Creek. The City may tap on at Highway 400 or at Highway 306. All single family residences and businesses belong to the County.

(6) Developments in the area north and west of the east branch of that Creek, from the intersection of this branch with Highway 369 to Bald Ridge Creek's confluence with Lake Lanier shall belong to the city, other than residences and businesses along Highway 369. We feel that this is the most equitable and fair method to preclude the unnecessary purchase of master meters by both governmental entities and developers, in the installation of a water system for the entire county.

This is the basis by which we the administration feel that the water agreement can be functional for the benefit of both governmental entities. If you have any concerns or questions, please do not hesitate to let us know.

Sincerely,

Ralph Roberts
County Administrator

Gerald Blackburn
City Manager

RR/GB/bt

ADDENDUM TO SECTION IV OF THE MEMORANDUM OF AGREEMENT EXECUTED THE 27th DAY OF FEBRUARY, 1987, BY FORSYTH COUNTY BOARD OF COMMISSIONERS AND THE MAYOR AND COUNCIL OF THE CITY OF CUMMING

A. BOUNDARIES

(1) Highway 20 East of Cumming. In the areas that are to be served by Forsyth County on Highway 20, the County will have the right to establish a meter at any major road intersection on the South side of the road that is to be served by the County. If a new development is established on the South side of Highway 20 East and a road will be developed to serve this development, then a master meter will be installed by the County to serve this development. Any single family residence or business that is tapped on to the line on either side of Highway 20 East will be served by the City on this line, and at no time will the County enter into the establishment of single family metering on Highway 20 East.

(2) Highway 20 West of Cumming. A master meter can be established by the County at any of the major road intersections either North or South of Highway 20 West with the exception of the intersections of Doc Sams Road, Franklin Gold Mine, Friendship Circle, Spot Road Connector and Spot Road with Highway 20 West. These are presently served by the City and will continue to be served by the City. At any other intersection, or with the development of a piece of property, a master meter may be established at any of such points by the County. A master meter should be installed by the County at the County Line and come up Heardsville Road to intersect with Gold Mine and Doc Sams

Roads in order to establish the loop, and from that point the County will go forward with any development it wishes in the way of water lines.

(3) Bethelview Road. At the intersection of Bethelview Road and Highway 20 West a master meter will be established by the County to run the water line down Bethelview Road. The City may establish a master meter at any intersection on their territorial (Eastern) side but all single family residence or business will be serviced by the County, whether now in service or later tapped on.

(4) Doc Bramblett Road and Spot Road. The City has an 8-inch line at the intersection of Doc Bramblett Road and Spot Road. At this point the County will establish a master meter and run North with a 12-inch line. The same format will be established in this territory as is on Bethelview Road, with the City's jurisdiction being East of Doc Bramblett Road. The line will continue to Highway 369. At this point a 12-inch line will be installed by the County from the intersection of Doc Bramblett Road and 369 East Southeasterly to Highway 9 (SR 9), at which point engineering consideration will be determined as to how the lines can be inter-connected.

(5) Highway 369 & 400. At the end of the County's line at 369 and the Dinner Deck on 400, a line will be run by the County from there to Six Mile Creek. The City may tap on at Highway 400 or at Highway 306. All single family residences and businesses belong to the County.

(6) Developments in the area North and West of the East branch of Bald Ridge Creek, from the intersection of this branch with Highway 369 to Bald Ridge Creek's confluence with Lake Lanier shall belong to the City, other than residences and businesses along Highway 369.

(7) Within the territorial jurisdictions of the City and County as set out above, the governing authority having that jurisdiction shall be entitled to install a master meter on any boundary road to service any development within that jurisdiction and thereafter to service elements within the development.

B. ENGINEERING.

A Manual of Technical Specifications and Construction Standard Details for Water System Construction will be prepared and submitted to each governing authority for acceptance and approval and will become a part of The Memorandum of Agreement.

C. WATER SALES.

(1) The City shall sell water to the County at a rate per one thousand gallons determined by the following formula: the cost of water production plus a "wheeling" fee shall equal the wholesale price to the County.

(2) Other matters relating to water sales, such as drought restrictions, service capacity, water quality testing, among others, shall be addressed in a separate document to be prepared

and submitted to each governing authority for acceptance and approval and will become a part of The Memorandum of Agreement.

Executed this 1st day of June, 1987, by the Board and the 19th day of May, 1987, by the City, at Cumming, Georgia.

BOARD OF COMMISSIONERS
OF FORSYTH COUNTY:

6-1-87 LEROY HUBBARD, CHAIRMAN

6-1-87 DAVID GILBERT, VICE CHAIRMAN

6-1-87 JAMES HARRINGTON, SECRETARY

6-1-87 CHARLES WELCH, COMMISSIONER

6-1-87 MICHAEL BENNETT, COMMISSIONER

Attest:

Betty Shadburn, Clerk

MAYOR AND COUNCIL
OF THE CITY OF CUMMING:

H. FORD GRAVITT, MAYOR 5/19/87

RALPH PERRY, COUNCILMAN 5-19-87

RUPERT SEXTON, COUNCILMAN 5-19-87

LEWIS LEDBETTER, COUNCILMAN

KENNETH J. VANDERHOFF, COUNCILMAN

QUINCY HOLTON, COUNCILMAN 5-19-87

Attest:

Estlene Stanford, City Clerk

FORSYTH COUNTY – CITY OF CUMMING
INTERGOVERNMENTAL AGREEMENT REGARDING RAW AND FINISHED WATER

This Intergovernmental Agreement ("IGA") is entered into as of the 26th day of October, 2012, by and between **FORSYTH COUNTY, GEORGIA**, a political subdivision of the State of Georgia, by and through its duly authorized governing authority, the Board of Commissioners of Forsyth County, Georgia (hereinafter referred to as "the County"), and the **CITY OF CUMMING**, a municipal corporation by and through its duly authorized governing authority, the City Council of Cumming, Georgia (hereinafter referred to as "the City").

W I T N E S S E T H:

WHEREAS, the parties entered into an Agreement for Contractual Water Usage dated May 5, 1998 (the "Prior Raw Water Agreement") regarding the County's purchase of raw water from the City; and

WHEREAS, the parties entered into a Wholesale Water Users Agreement dated May 26, 1987, amended on January 22, 1997 (the "Prior Finished Water Agreement") regarding the County's purchase of finished water from the City; and

WHEREAS, both the Prior Raw Water Agreement and the Prior Finished Water Agreement terminated on May 26, 2012 by their express terms; and

WHEREAS, the Parties desire to retroactively carry forward the terms of the Prior Raw Water Agreement and Prior Finished Water Agreement from May 27, 2012 until the date of approval of this Agreement, thereby validating and ratifying all amounts paid from the date of termination of same until the date of approval of the present Agreement; and

WHEREAS, on October 16, 2012, the Parties hereto agreed in principle to new terms

1

related to the provision of raw and finished water from the City to the County; and

WHEREAS, pursuant to the Georgia Open Meetings Act it is necessary for these terms to be ratified in open session prior to becoming binding on either government; and

WHEREAS, the Parties also desire to compromise all differences over invoice 201201050719 dated January 5, 2012 related to the City's capital costs related to its raw water intake facility, and further to set forth the rights and obligations of the parties related to further requests for surface water withdrawal permits from the State of Georgia EPD, the U.S. Army Corps of Engineers, or any other regulatory agency related to surface water permitting;

WHEREAS, the Parties are authorized to enter into this Agreement pursuant to Article IX, Section III, Paragraph I of the Constitution of the State of Georgia of 1983 regarding intergovernmental contracts.

NOW, THEREFORE, it is agreed by and between the County and the City as follows:

ARTICLE I
FINISHED WATER AGREEMENT

The County shall purchase from the City 400,000,000 gallons of finished water per twelve (12) month period of the Initial Term, First Renewal, or Second Renewal, as applicable, at a rate of $2.43 per 1,000 gallons, subject to an annual CPI-U adjustment as set forth in Article V. The daily quantities to be purchased in satisfaction of this annual obligation shall be determined in the reasonable discretion of the County, provided that the County's demand on any particular day may not result in an EPD permit violation by either Party.

ARTICLE II.
RAW WATER AGREEMENT

A. Rates

1. Currently, the City has a Surface Water Withdrawal Permit for a maximum monthly rate of 18 MGD/21 MGD (max. daily) and the County has a Surface Water Withdrawal Permit for a maximum monthly rate of 14 MGD/16 MGD (max. daily) for a total maximum monthly rate of 32 MGD/37 MGD (max. daily) through the City's Intake Facility;

2. The City shall make available and the County shall be entitled to purchase the entire amount of its Surface Water Withdrawal Permit (14 MGD max. month/16 MGD max. daily) derived from the City's Intake Facility at a rate of $ .50 per 1,000 gallons (the "Raw Water Rate"). The Raw Water Rate shall be subject to an annual CPI-U adjustment as set forth in Article V;

3. The City shall make available and the County shall be entitled to purchase an additional maximum monthly amount of 3.5 MGD/4.1 MGD (max. daily) of raw water from the City's Surface Water Withdrawal Permit allocation at the Raw Water Rate as calculated in Subparagraph (2). The City shall be obligated to secure the requisite approvals from the State EPD, if any, to effectuate this raw water purchase;

4. The County shall be entitled to purchase from the City any additional raw water that the City has available to sell from the City's permit allocation, as the permit may be modified from time to time, at the Raw Water Rate as calculated in Subparagraph (2). With the exception of the annual finished water requirement in Article I, the City shall have a good faith obligation to make raw water available to the County first, prior to requesting that the County purchase finished water. If the County

has a need to purchase additional finished water, and if finished water is available from the City, the County shall be entitled to purchase same at the then-existing finished water rate as provided in Article I; and,

5. The County shall be entitled to purchase from the City any additional amounts of raw water from the County's permit allocation derived from the City's Intake Facility, as the permit may be modified from time to time, at the Raw Water Rate as calculated in Subparagraph (2).

B. Maintenance, Operations, Capital Costs

1. The responsibility for operation and maintenance of the City's Intake Facility and all other components of the City Raw Water Transmission Main is solely the City's. Such operations include, but are not limited to, withdrawing raw water from Lake Lanier for the purpose of serving both the City and County Water Treatment Plants; manual or automated operation of pumps and motors to provide such service; routine and preventive maintenance, repair, and replacement for pumps, pipelines, valves, intakes, and supporting structures; and operation and maintenance of power and control systems.

2. The City will operate the facilities described in paragraph (II)(B)(1) at the rate, reliability, and level of service necessary to meet the City's raw water needs and to meet the County's raw water needs as those needs may expand from time to time. To satisfy this obligation, the City agrees to promptly respond to the County's requests for adjustments in the quantity of water being pumped from the City Intake Facility.

3. In the event of a raw water shortage resulting from mechanical failure, extreme drought, high demands, acts of God, or other extreme and unavoidable events,

the City and County agree to share the available raw water according to each Party's proportional actual use of raw water as measured for that six (6) month period immediately prior to the shortage.

4. There shall be no capital cost contributions from the County to the City except as specifically set forth in this Agreement, nor shall the County have any ongoing operation and maintenance costs related to the facilities described in paragraph (II)(B)(1). This paragraph notwithstanding, the County shall be solely responsible for those capital upgrade costs necessary to meet the needs of its own permitted capacity requirements but to the extent such upgrades are physically attached to the City's Intake Facility (i.e., pumps, etc.), such upgrades shall be dedicated to the City upon completion and the City shall be required to repair and maintain same. This obligation of ongoing maintenance and repair by the City shall serve as good and adequate consideration for the County's dedication.

ARTICLE III – INTAKE

Forsyth County shall tender to the City of Cumming $11,436,450.13 within 30 days of both the City and County approving this IGA, which amount shall constitute payment in full of disputed invoice 201201050719 dated January 5, 2012 and shall further serve as good and valuable consideration for the following:

1. To the extent allowed by law, a non-possessory leasehold interest in the City's Intake Facility to run coterminous with the term of this Agreement including any renewal(s).

2. With respect to any request from either the City or the County to the State EPD, the U.S. Army Corps of Engineers (USACE), or any other regulatory agency for a surface water withdrawal permit, modification of such permit, modification or submission related to a water

storage contract or amended contract, or like permit, permission, or contract, for water from Lake Lanier out of the City's intake structure – over and above the existing, combined 37 MGD (max. daily) EPD permit and/or the existing hold over storage contract with the USACE - the City of Cumming and Forsyth County shall work cooperatively and in good faith to ensure that Forsyth County receives no less than 65% of any increase according to need, it being the intent of the City and County that at that point when the maximum capacity of water is flowing through the intake structure, the County's permitted allocation and/or associated storage capacity shall entitle the County to no less than 68 MGD.

3. The City agrees that it will not oppose any request by the County to the State EPD or other regulatory agency for a modified, increased, or new County surface water withdrawal permit or a water storage contract from any source, so long as the City reserves the right to oppose any request by the County that may interfere with or negatively impact the existing City surface water withdrawal permit or a future water storage contract.

ARTICLE IV - TERM

The term of this Agreement shall be from November 1, 2012 to October 31, 2022 ("Initial Term"). The County shall have an exclusive and unilateral right to extend this Agreement from November 1, 2022 to October 31, 2032 (the "First Renewal"); and, from November 1, 2032 to October 31, 2042 (the "Second Renewal"). In the event the County desires to trigger the First Renewal or Second Renewal, it shall provide the City written notice of its intention to renew at least 6 months prior to the then-existing term expiring. In the absence of written notice of renewal by the County, the Agreement shall terminate at the end of the Initial Term or First Renewal. The City shall not have the right to trigger a renewal.

ARTICLE V – CPI-U ADJUSTMENT

This paragraph shall control all water cost adjustments under this contract. Annual adjustments shall be made using the Consumer Price Index for All Urban Consumers, Atlanta (CPI-U) for the immediately preceding calendar year as published by the United States Bureau of Labor Statistics of the United States Department of Labor. Commencing in 2013, the City shall provide annual notice to the County of the relevant CPI adjustment (positive or negative) no later than November 1 and the new rate shall become effective January 1 of the following year.

ARTICLE VI – SERVICE AREA

The City and County will continue to comply with and honor the 1987 water and sewer service area boundary map presently in effect, including recognizing any water or sewer customers presently being served by either entity, and further agree to work together in good faith to create a new water and sewer service boundary map that will incorporate those areas that may be outside the 1987 boundary where either the City or County have installed water and sewer infrastructure.

ARTICLE VII - MISCELLANEOUS

Selling of Water Outside Forsyth County. The County agrees that it will not sell water derived from the City Intake Facility to any other governmental unit outside of Forsyth County, Georgia except (1) to Etowah Water and Sewer Authority which the County is selling water as of the date of this Agreement, or (2) with the written permission from the City.

Ratification of water purchase from May 27, 2012 through the date of this Agreement. All purchases of raw and finished water by and between the County and City,

pursuant to the methodology set forth in the Prior Raw Water Agreement and Prior Finished Water Agreement, beginning May 27, 2012 up to and including the date of this Agreement are hereby ratified and approved. The City and County agree that all obligations under the Prior Raw Water Agreement and Prior Finished Water Agreement do hereby stand fully discharged and satisfied.

Right to pursue other water sources. Nothing in this Agreement shall be interpreted or construed as limiting in any manner the other Parties' right to seek raw or finished water from other sources, including the necessary regulatory approvals for same.

Assignment. Neither Party shall, without written consent of the other Party, assign or transfer this Intergovernmental Agreement or any rights or obligations hereunder.

Amendment. The terms of this Intergovernmental Agreement shall not be altered, amended, or modified except in writing signed by duly authorized officers or representatives of the Parties.

Construction of Agreement. This Intergovernmental Agreement shall be construed under the laws of the State of Georgia. This Agreement shall be deemed to have been equally drafted by both Parties such that no presumption or inference may arise against either Party related to which entity may have drafted any particular provision.

Termination. The Parties agree that the City shall not have the right to terminate this Agreement, but it may vindicate all lawful rights related to an actual or alleged breach.

Severability. If any paragraph, subparagraph, sentence, clause, phrase, or any portion of this Intergovernmental Agreement shall be declared invalid or unconstitutional by any court of competent jurisdiction or if the provisions of any part of this Intergovernmental Agreement as applied to any particular situation or set of circumstances shall be declared invalid or

unconstitutional by a court of competent jurisdiction, such invalidity shall not be construed to affect the portions of this Intergovernmental Agreement not held to be invalid. It is hereby declared to be the intent of the parties to provide for separable and divisible parts, and they do hereby adopt any and all parts hereof as may not be held invalid for any reason.

Notice.

Any notice of communications hereunder shall be in writing and shall be deemed to have been delivered by hand delivery or when deposited in the United States mail, registered or certified, addressed as follows:

City of Cumming:

Attn: Mayor
100 Main Street
Cumming, Georgia 30040

With a copy to:

Dana B. Miles, Esq.
Miles, Patterson, Hansford, Tallant, LLC
202 Tribble Gap Road, Suite 200
Cumming, Georgia 30040

Forsyth County:
Forsyth County Manager
Forsyth County Board of Commissioners
110 East Main Street
Cumming, Georgia 30040

With a copy to:

Ken E. Jarrard, Esq.
Forsyth County Attorney
105 Pilgrim Village Drive
Suite 200
Cumming, Georgia 30040

Or to such other address as either Party may designate for itself by written notice to the other Party from time to time.

No Third Party Rights. This Intergovernmental Agreement shall be exclusively for the benefit of Cumming and Forsyth County and shall not provide any third parties with any remedy, claim, liability, reimbursement, cause of action, or other right.

Counterparts. This Intergovernmental Agreement may be executed in one or more counterparts, each of which shall constitute an original. It shall not be necessary that each signatory sign the same counterpart as long as each has signed an identical counterpart.

Authority to Enter Agreement. Each of the individuals who executes this Intergovernmental Agreement agrees and represents that he is authorized to execute this Intergovernmental Agreement on behalf of the respective government and further agrees and represents that this Intergovernmental Agreement has been duly passed upon by his respective government and spread upon the Minutes. Accordingly, Forsyth County and Cumming both waive and release any right to contest the enforceability of this Intergovernmental Agreement based upon the execution and/or approval thereof.

IN WITNESS WHEREOF, the parties have caused this Intergovernmental Agreement to be executed under seal as of the date first written above.

CITY OF CUMMING, GEORGIA

By: _____
Mayor

Attest:

_____
City Clerk

10

[AFFIX SEAL]

FORSYTH COUNTY, GEORGIA

By: _____
Chairman

Attest:

_____
County Clerk

[AFFIX SEAL]

Georgia Department of Community Affairs

SERVICE DELIVERY STRATEGY

FORM 3: Summary of Land Use Agreements

Instructions:

Answer each question below, attaching additional pages as necessary. Please note that any changes to the answers provided will require an update of the service delivery strategy. If the contact person for this service (listed at the bottom of this page) changes, this should be reported to the Department of Community Affairs.

COUNTY:FORSYTH COUNTY

1. What incompatibilities or conflicts between the land use plans of local governments were identified in the process of developing the service delivery strategy?
No conflicts were identified. The City of Cumming and Forsyth County updated their comprehensive plans earlier in 2012 so their respective land use plans have been recently reviewed and amended as necessary.

2. Check the boxes indicating how these incompatibilities or conflicts were addressed:

- ☐ Amendments to existing comprehensive plans
- ☐ Adoption of a joint comprehensive plan
- ☐ Other measures (amend zoning ordinances, add environmental regulations, etc.)

If "other measures" was checked, describe these measures:
Describe "Other" Measures Here

NOTE:

If the necessary plan amendments, regulations, ordinances, etc. have not yet been formally adopted, indicate when each of the affected local governments will adopt them.

3. What policies, procedures and/or processes have been established by local governments (and water and sewer authorities) to ensure that new extraterritorial water and sewer service will be consistent with all applicable land use plans and ordinances? The City of Cumming and Forsyth County will continue to monitor land use plans as infrastructure master plans are amended. Coordination will continue so that water and sewer service will remain consistent with local plans and regulations.

4. Person completing form: **Vanessa Bernstein, Forsyth County Senior Planner**

Phone number: **678-513-5866** Date completed: 10/25/12

5. Is this the person who should be contacted by state agencies when evaluating whether proposed local government projects are consistent with the service delivery strategy? ☒Yes ☐No

If not, provide designated contact person(s) and phone number(s) below:

TYPE CONTACT NAME, TITLE & PHONE HERE

Page 1 of 1

Georgia Department of Community Affairs

SERVICE DELIVERY STRATEGY

FORM 4: Certifications

Instructions:

This form must, at a minimum, be signed by an authorized representative of the following governments: 1) the county; 2) the city serving as the county seat; 3) all cities having a 2000 population of over 9,000 residing within the county; and 4) no less than 50% of all other cities with a 2000 population of between 500 and 9,000 residing within the county. Cities with a 2000 population below 500 and local authorities providing services under the strategy are not required to sign this form, but are encouraged to do so.

COUNTY: FORSYTH COUNTY

We, the undersigned authorized representatives of the jurisdictions listed below, certify that:

1. We have executed agreements for implementation of our service delivery strategy and the attached forms provide an accurate depiction of our agreed upon strategy (O.C.G.A 36-70-21);
2. Our service delivery strategy promotes the delivery of local government services in the most efficient, effective, and responsive manner (O.C.G.A. 36-70-24 (1));
3. Our service delivery strategy provides that water or sewer fees charged to customers located outside the geographic boundaries of a service provider are reasonable and are not arbitrarily higher than the fees charged to customers located within the geographic boundaries of the service provider (O.C.G.A. 36-70-24 (20); and
4. Our service delivery strategy ensures that the cost of any services the county government provides (including those jointly funded by the county and one or more municipalities) primarily for the benefit of the unincorporated area of the county are borne by the unincorporated area residents, individuals, and property owners who receive such service (O.C.G.A. 36-70-24 (3)).

JURISDICTION	TITLE	NAME	SIGNATURE	DATE
CITY OF CUMMING	MAYOR	Ford Gravitt	H. Ford Gravitt	10/30/12
FORSYTH COUNTY	CHAIRMAN	Jim Boff	Jim Boff	10/29/2012

RESOLUTION OF THE BOARD OF COMMISSIONERS RATIFYING THOSE SERVICE DELIVERY STRATEGY FORMS AND INTERGOVERNMENTAL AGREEMENTS PREVIOUSLY TENDERED TO THE DEPARTMENT OF COMMUNITY AFFAIRS

WHEREAS, on Friday, October 26, the Board of Commissioners of Forsyth County did authorize the Chairman of the Board of Commissioners, upon concurrence by senior staff and the county attorney, to execute all required Department of Community Affairs forms necessary to fulfill the Service Delivery Strategy requirements prior to October 31, 2012;

WHEREAS, on that same date, the Board of Commissioners authorized the Chairman of the Board of Commissioners, upon concurrence by senior staff and the county attorney, to execute certain necessary Intergovernmental Agreements (IGAs) between Forsyth County and the City of Cumming necessary to fulfill the Service Delivery Strategy requirements prior to October 31, 2012;

WHEREAS, the Board of Commissioners further instructed that such SDS forms and IGAs be returned to the Board of Commissioners for ratification by the full Board;

WHEREAS, the Chairman of the Board of Commissioners did execute the necessary SDS forms and IGAS, and timely submission to DCA of such forms did occur; and,

WHEREAS, it is now necessary for the Board of Commissioners to ratify said SDS forms and IGAS.

NOW THEREFORE BE IT RESOLVED,

- That the attached DCA forms consisting of Form 1 and multiple Form 2(s), wherein Form 2 constitutes the Service Delivery "Summary of Service Delivery Arrangements," Form 3 and Form 4, all of which are attached hereto and incorporated herein as Exhibit A, are hereby ratified and affirmed by the Board of Commissioners; and,
- That the attached IGAs between Forsyth County and the City of Cumming, consisting of an IGA for (1) Municipal Court Services, (2) 911 Services, (3) Land Use Classification Disputes, (4) Ambulance and Emergency Rescue Services, and (5) Fire Code Permitting, all of which are attached hereto as Exhibit B, are hereby ratified and affirmed by the Board of Commissioners.

This 1 day of November, 2012.

Jim Boff, Chairman

Patrick B. Bell, Vice Chairman

Todd Levent, Secretary

Ralph J. Amos, Member

Brian R. Tam, Member

Attest:

Clerk

Forsyth County
Department of Planning &
Community Development
110 E. Main Street Suite 100
Cumming GA 30040
770.781.2115
www.forsythco.com

City of Cumming
Department of Planning &
Zoning
100 Main Street
Cumming GA 30040
770.781.2024
www.cityofcumming.com

APPENDIX E
EPD WATER PERMITS; SURFACE WATER & TREATMENT OPERATION

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Watershed Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1152, East Tower
Atlanta, Georgia 30334
404-463-1511

JAN 3 1 2020

Mr. Jonathan Heard, Director of Utilities
City of Cumming
100 Main Street
Cumming, GA 30040

Re: **Cumming Water System**
WSID# 1170000
Forsyth County

Dear Mr. Heard:

In accordance with the Georgia Safe Drinking Water Act of 1977, as passed by the Georgia General Assembly, and the Rules for Safe Drinking Water, Chapter 391-3-5, a permit to operate the Cumming Water System, a public water system located in Forsyth County, Georgia has been issued by the Environmental Protection Division (EPD) and is hereby enclosed. The specific conditions for operation of the water system are outlined in the pages attached to the permit. **Please provide a copy of this permit to anyone directly involved in the operation or sample collection for this water system.**

The Rules for Safe Drinking Water, Chapter 391-3-5, specify the number and frequency of microbiological, chemical, and radiological samples that must be analyzed for your water system. These compliance samples must be analyzed by EPD's Laboratory or any other commercial laboratory certified by EPD to conduct the analyses. If you participate in EPD's "Drinking Water Laboratory and Related Services", sample bottles with instructions for sample collection, preservation, and return shipping will be mailed to you as sampling is required. If you do not utilize the services of EPD's Laboratory for testing, you are responsible for complying with all applicable monitoring schedules in the Rules for Safe Drinking Water. Please visit http://gadrinkingwater.net to view your required monitoring schedules and other pertinent water system information.

Please remember that all bacteriological and chemical samples, reports, and other information for this system that are submitted to EPD should be identified by the water system identification number, WSID# 1170000.

Sincerely,

Peter C. Nwogu
Drinking Water Unit Manager

Enclosure
cc: Drinking Water Permitting & Engineering Program, EPD
Forsyth County Health Department

PERMIT NO. CS1170000

ISSUE DATE: JAN 3 1 2020

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

PERMIT TO OPERATE A PUBLIC WATER SYSTEM

In compliance with the provisions of the **GEORGIA SAFE DRINKING WATER ACT of 1977, O.C.G.A. 12-5-170 et. seq.**, and the **RULES, CHAPTER 391-3-5**, adopted pursuant to the **ACT**

City of Cumming

is issued a **PERMIT TO OPERATE A PUBLIC COMMUNITY WATER SYSTEM** named

Cumming Water System

and located at

Cumming, Forsyth County, Georgia

THIS PERMIT to operate the above public water system shall become effective on the date shown above and shall have a fixed term of ten (10) years, absent any prior revocation or modification.

THIS PERMIT is issued subject to the terms, conditions and schedules of compliance as follows:

1. **THE PERMITTEE** shall at all times operate the public water system in full compliance with the **GEORGIA SAFE DRINKING WATER ACT of 1977**, and the **RULES, CHAPTER 391-3-5**, adopted under the **ACT**. **THE DIRECTOR** may modify, suspend or revoke this permit as provided therein.

2. **THIS PERMIT** is transferable only with a change of ownership. **THE PERMITTEE** shall notify the succeeding owner by letter of the existing permit and surrender the original permit to the Director. The succeeding owner shall apply to the Director for a permit transfer within 30 days of receiving title to the property.

3. **THIS PERMIT** is further subject to the terms, conditions and schedules of compliance specified on the attached pages.

Richard E. Dunn, Director
Environmental Protection Division

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

OWNER: **City of Cumming** PERMIT NO.: **CS1170000**

SYSTEM: **Cumming Water System**

PERMIT CONDITIONS

4. **This permit is for the operation of a public water system using surface water as the principal source of supply, supplemented by purchased surface water.** The approved production rate(s) for the surface water treatment plant(s) and other approved sources of water are:

Lake Lanier, Source 101
Cumming Water Plant: 12,500 GPM (18.0 MGD) W/ 6 Filters @ 6 GPM/SQFT
Package Plant: 4,166 GPM (6.0 MGD) W/ 3 Filters @ 5 GPM/SQFT
Total production shall not exceed 30.0 MGD in a 24-hour period and 23.82 MGD on a monthly average basis.

Forsyth County Water System, WSID# 1170050, Source 102

Operation of the water plant(s) in excess of the approved production rate(s) in a twenty-four (24) hour period (starting at 0000 to midnight 2400 hours) is a violation of this permit. Violations must be reported to the Drinking Water Program by telephone within forty-eight (48) hours and confirmed in writing within ten (10) days. **The total amount of water produced must not exceed the limits imposed by your surface water withdrawal permit, #058-1290-07.**

5. The permittee must provide continuous disinfection by chlorinating all water distributed by the system to maintain a detectable residual of free chlorine in the recommended amount of 0.2 milligrams per liter in all parts of the distribution system, or as specified in Section 391-3-5-.14, as amended, of the Rules for Safe Drinking Water.

6. **The permittee shall analyze or have analyzed all microbiological and chemical samples required by the Rules for Safe Drinking Water, Chapter 391-3-5. Monitoring for each contaminant must be performed as scheduled by the Georgia Environmental Protection Division's (EPD) Watershed Compliance Program (WCP). The supplier must provide all test results to the WCP within the time frames established in the schedules.** The permittee may use the laboratory services of the EPD's certified laboratory or any other laboratory certified by the WCP to perform the specific analysis. If a laboratory other than the EPD's certified laboratory is used, the laboratory results must be submitted to the following address as specified in Section 391-3-5-.30:

Environmental Protection Division
Watershed Protection Branch Compliance Program
Drinking Water Compliance Unit
2 Martin Luther King, Jr. Drive, SE, Suite 1152 East
Atlanta, Georgia 30334

The format used to report results must be approved by the WCP and must identify the system by the water system identification number, WSID# 1170000, and the laboratory performing the analysis. The laboratory's certification number must be included on the report. Results requiring immediate notification should be reported to the WCP by telephone at (404) 463-1511 or fax at (404) 651-9590.

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

OWNER: **City of Cumming** PERMIT NO.: **CS1170000**

SYSTEM: **Cumming Water System**

PERMIT CONDITIONS

7. Reports must be maintained by the permittee on the premises of the water system and be available for inspection. **A true and correct copy of the operation records and other reports must be sent to the following address, by the tenth day of the month following the month being reported**, unless otherwise stated in Section 391-3-5-.30 or elsewhere in the Rules:

Environmental Protection Division
Drinking Water Permitting & Engineering Program
Suite 1362, Floyd Towers East
2 Martin Luther King, Jr. Drive, SE
Atlanta, Georgia 30334
Phone: (404) 656-2750
Fax: (404) 651-9590

8. **The permittee shall ensure that this public water system is operated in compliance with the Georgia Certification of Water and Wastewater Treatment Plant Operators and Laboratory Analysts Act**, as amended, and the Rules adopted thereunder. The certification classification must be consistent with the public water system classification specified in Section 391-3-5-.39 of the Rules for Safe Drinking Water.

9. The permittee shall comply with O.C.G.A Sections 12-5-7 and 12-5-8 regarding limitations on outdoor irrigation, local variances from state restrictions on outdoor watering, and any rules and regulations related to drought management promulgated thereafter. This condition applies to any water system that holds a water withdrawal permit, or uses water provided by a system with a withdrawal permit.

10. Drinking water distributed by the permittee should not contain any impurity which will cause offense to the sense of sight, taste or smell and should not be excessively corrosive as to cause degradation of the water quality or deterioration of the distribution system, as specified in Section 391-3-5-.19 and .26 of the Rules for Safe Drinking Water.

11. The permittee is required to have a water conservation and cross-connection control plan on file with the Division.

12. **The permittee is required to provide continuous fluoridation to all water distributed by the system**, as specified in Section 391-3-5-.16 of the Rules for Safe Drinking Water.

13. The permittee shall comply with Section 391-3-.5-.06 of the Rules for Safe Drinking Water and shall meter all water supply sources connected to the public water system and shall report the system's water usage to the EPD's Drinking Water Permitting & Engineering Program.

14. The permittee shall comply with Section 391-3-5-.10 of the Rules for Safe Drinking Water and shall meter all new services connected to public water systems, unless specifically directed otherwise by the Director.

15. This permit replaces all Permits to Operate a Public Water System previously issued for the operation of this public water system.

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Watershed Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1152, East Tower
Atlanta, Georgia 30334
404-463-1511

JUN 8 2018

Mr. Johnathan Heard, Director of Utilities
City of Cumming
100 Main Street
Cumming, GA 30040

RE: Surface Water Withdrawal Permit Application (Modification)
Permit # 058-1290-07, Forsyth County
Source: Lake Lanier (Chattahoochee River Basin)
Current Permit Limits: 30.0mgd max 24-hr day/ 23.82 mgd monthly average/12.82 mgd annual average

Dear Mr. Heard:

In accordance with the Georgia Water Quality Control Act, as amended, the above referenced permit to withdraw surface water from Lake Lanier has been issued by the Division and is hereby enclosed. The conditions of compliance are provided on pages 2 and 3 of this permit. Special Condition number (10) requires the permit holder to submit to the Division within the first 10 days of the calendar month, a monthly Surface Water Withdrawal Report for the previous month, showing daily raw water withdrawals associated with this permit. A copy of this reporting form is included.

If you have any questions, please do not hesitate to contact me or write me at (404) 656-6937 or johanna.smith@dnr.ga.gov.

Sincerely,

Johanna Smith

Johanna Smith, P.E.
Surface Water Unit Manager
Water Supply Program

cc: Jim Cooley, Mountain District

PERMIT NO. 058-1290-07
ISSUANCE DATE: JUN 8 2018

GEORGIA
DEPARTMENT OF NATURAL RESOURCES

ENVIRONMENTAL PROTECTION DIVISION

PERMIT TO WITHDRAW, DIVERT OR IMPOUND SURFACE WATER

PERMIT HOLDER'S NAME	**City of Cumming**
PERMIT HOLDER'S ADDRESS	**100 Main Street, Cumming, Georgia 30040**
COUNTY:	**Forsyth County**

In accordance with the provisions of the Georgia Water Quality Control Act, (O.C.G.A. § 12-5-20 et seq.) as amended, and the Rules and Regulations for Water Quality Control, Chapter 391-3-6, promulgated pursuant thereto, this permit is issued to **withdraw** surface water from the (source) **Lake Lanier** in the **Chattahoochee River Basin** for the purpose of **municipal water supply**.

The City of Cumming (City) must comply with the following limitations:

(1) Maximum 24 hour: Withdrawal **30.00** MGD; Impoundment ___ MGD;
Diversion ____ MGD
(2) Not to exceed a monthly average of **23.82** MGD
(3) Not to exceed an annual average of **12.82** MGD

This Permit is conditioned upon the permit holder complying with the attached **Standard Conditions** (1 through 5) and the additional **Special Conditions** (6 through 19) which are hereby made a part of this Permit.

In accordance with the application dated 02/24/2017 and in conformity with the statements and supporting data entered therein or attached thereto, all of which are filed with the Environmental Protection Division of the Department of Natural Resources and are hereby made part of this Permit.

This Permit is effective from the date first above written and is subject to revocation pursuant to the Georgia Water Quality Control Act, as amended, O.C.G.A. § 12-5-31 (k).

Absent prior revocation in accordance with the above language, this Permit will expire **ten (10) years** from the issuance date on this permit.

Director
Environmental Protection Division

STATE OF GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

PAGE 2 OF 3
PERMIT NO. **058-1290-07**

This permit is conditioned upon the City complying with the following:

STANDARD CONDITIONS

(1) The provisions of the Water Quality Control Act, as amended, or any of the Rules and Regulations promulgated thereto;

(2) This permit must not be transferred except with the approval of the Division;

(3) The use of surface water is limited to the quantities and purposes as specified herein;

(4) The City must submit annually to the Division, within 30 days of completion of the calendar year, a report listing for each month of the previous year:

a. The gallons per day withdrawn, based on an average of the daily withdrawals for the month;

b. The maximum 24 hour withdrawal;

(5) All permittees desiring to renew a permit shall submit an application for renewal to the Director within six (6) months prior to its expiration.

SPECIAL CONDITIONS

(6) The City's Lake Lanier intake is located east of Georgia 400 (exit 16) at the end of Magnolia Lane. All water withdrawn must be metered at or immediately upon leaving the intake structure.

(7) The City and Forsyth County (County) will continue to operate with a single shared raw water intake structure in Lake Lanier, until a new raw water intake is constructed for the County's withdrawals in Lake Lanier and permitted accordingly.

(8) In addition to abiding by the Maximum 24-hr and Monthly Average quantities on page one (1) of this permit, the City is bound by an average annual withdrawal limit of 12.82 MGD from Lake Lanier.

(9) The withdrawal limits of this permit include a contracted annual amount of 400 million gallons (finished water) that will be supplied to the County's water system (Permit No. 058-1207-06).

(10) In addition to Standard Condition number (4), the City must submit to the EPD within 10 days of completion of the calendar month, a monthly Surface Water Withdrawal Report for the previous month showing daily raw water withdrawals associated with this Permit.

(11) The permit holder must submit annually to EPD, before March 1 of the calendar year for the previous year, a report for an annual average estimate of all water transferred out of or into the Chattahoochee River Basin (in million gallons per day). The estimate should include the following:

i. Water that originates in the Chattahoochee River Basin but is transferred by the permit holder, or an entity that purchases water from the permit holder, into another river basin and discharged or consumed, broken down by the individual recipient of the transferred water and the river basin into which it is transferred.

ii. Water that is returned to the Chattahoochee River Basin by the permit holder, or an entity that purchases water from the permit holder, broken down by individual who returned the transferred water.

iii. Water that does not originate in the Chattahoochee River Basin but is transferred into and consumed and/or discharged within the Chattahoochee River Basin by the permit holder, broken down by individual supplier of the transferred water and the river basin in which the water originates.

(12) Water loss reports of the real water loss component of Non-revenue Water (NRW) will require that progress reports be submitted that 1) describe measures implemented, and 2) demonstrate that progress is being made to reduce the system's water loss.

(13) This surface water withdrawal permit and any future modification or re-issuances of such, is conditional upon implementation of the Water Conservation Plan. The City must demonstrate an effort to increase water use efficiency and submit an updated five-year Water Conservation Progress Report to EPD pursuant to the completed Water Conservation Plan no later than April 30, 2023.

(14) The City must abide by applicable water conservation requirements.

(15) The City must abide by applicable drought response requirements.

(16) Water associated with this Permit must not be withdrawn by, released for, or otherwise utilized by any other entity or for any purpose without first modifying this Permit.

(17) This permit supersedes any and all previous permits of the same permit number.

(18) The City must adhere to the conditions of the 2017 Metro North Georgia Water Planning District Water Supply and Water Conservation Management Plan.

(19) The EPD has the authority to modify any surface water withdrawal permit at any time.

PERMIT MODIFICATION

APPENDIX F
EPD WATER AUDIT 2021

AWWA Free Water Audit Software v6.0

FWAS v6.0

This spreadsheet-based water audit tool is designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. It provides a "top-down" summary water audit format and is not meant to take the place of a full-scale, comprehensive water audit format. Auditors are strongly encouraged to refer to the most current edition of AWWA M36 Manual for Water Audits for detailed guidance on the water auditing process and targeting loss reduction levels. This tool contains several separate worksheets. Sheets can be accessed using the tabs at the bottom of the screen, or by clicking the TOC links below.

Table of Contents (TOC)

AWWA Web Resources for Water Loss Control

https://www.awwa.org/Resources-Tools/Resource-Topics/Water-Loss-Control

Items referenced in the Free Water Audit Software v6.0 on the web:

- Data Grading Matrix v6.0
- Example Water Audit v6.0
- Water Audit Compiler v6.0
- AWWA Reports on Performance Indicators
- M36 Manual

Enter Basic Information

Name of Utility:	Cumming Utilities - City of Cumming, GA
Name of Contact Person:	Jonathon Heard
Email:	jon.heard@cityofcumming.net
Telephone | Ext.:	404-379-4641
City/Town/Municipality:	Cumming
State / Province:	Georgia (GA)
Country:	USA
Audit Preparation Date:	Feb 18 2022
Audit Year:	2021
Audit Year Label:	Fiscal (Fiscal, Calendar, etc)
Audit Period Start Date:	Jan 01 2021
Audit Period End Date:	Dec 31 2021
Volume Reporting Units:	Million gallons (US)
Water System Structure:	Hybrid Wholesale + F
Water Type:	Potable Water
System ID Number:	1170000
Validator Name/ID:	Muyun Ye/263
Validator Email:	mandy@cecincga.com
Estimated Total Population Served by Water Utility:	66,957

Key of Input Acronyms

In order of appearance in the Worksheet

VOS	Volume from Own Sources
VOSEA	VOS Error Adjustment
WI	Water Imported
WIEA	WI Error Adjustment
WE	Water Exported
WEEA	WE Error Adjustment
BMAC	Billed Metered Authorized Consumption
BUAC	Billed Unmetered Authorized Consumption
UMAC	Unbilled Metered Authorized Consumption
UUAC	Unbilled Unmetered Authorized Consumption
SDHE	Systematic Data Handling Errors
CMI	Customer Metering Inaccuracies
UC	Unauthorized Consumption
Lm	Length of mains
Nc	Number of service connections
Lp	Average length of (private) customer service line
AOP	Average Operating Pressure
CRUC	Customer Retail Unit Charge
VPC	Variable Production Cost

Color Key User input | Calculated | Optional default

Guidance for the Worksheet

Choosing to enter unit of **percent** or **volume** (applies to VOSEA, WIEA, WEEA, CMI) choose entry option:

1.00%	percent	*or*	
	volume	25.000	

Choosing to enter **default** or **custom input** (applies to UUAC, SDHE, UC) choose entry option:

0.25%	default	*or*	
	custom	75.000	

Guidance for the Interactive Data Grading

Use acronym buttons in IDG header to navigate among inputs. Acronym Key above. White = needs answers, orange = complete, clear = not required. Example below.

After clicking an acronym button, answer all visible questions in the order they're presented, choosing best-fit answer

Grade will populate when all visible questions are complete for an input: **7**

The limiting criteria will be labeled along the right. If only 1 limiting criterion is shown, improving on that criterion will achieve a higher data grade. If multiple limiting criteria are shown, improving on *each* limiting criterion is necessary to achieve a higher data grade. A complete inventory of data grading criteria is available in the Data Grading Matrix v6.0 (see web resources)

Limiting

If you have questions or comments regarding this software please contact us at: wlc@awwa.org

AWWA Free Water Audit Software: Worksheet

FWAS v6.0
American Water Works Association.

Water Audit Report for: Cumming Utilities - City of Cumming, GA
Audit Year: 2021 | Jan 01 2021 - Dec 31 2021 | Fiscal

Click 'n' to add notes
Click 'g' to determine data validity grade
To edit water system info: go to start page
To access definitions, click the input name
All volumes to be entered as: MILLION GALLONS (US) PER YEAR

WATER SUPPLIED

Water Supplied Error Adjustments — choose entry option:

		n	g				n	g				
VOS	Volume from Own Sources:	n	g	7	3,202.558	MG/Yr	n	g	8	0.06%	percent	over-registration VOSEA
WI	Water Imported:	n	g	3	0.089	MG/Yr	n	g	3	0.00%	percent	WIEA
WE	Water Exported:	n	g	6	447.831	MG/Yr	n	g	5	1.10%	percent	under-registration WEEA

WATER SUPPLIED: 2,747.915 MG/Yr

AUTHORIZED CONSUMPTION

		n	g				choose entry option:		
BMAC	Billed Metered:	n	g	8	2,171.801	MG/Yr			
BUAC	Billed Unmetered:	n	g	n/a	0.000	MG/Yr			
UMAC	Unbilled Metered:	n	g	10	19.267	MG/Yr			
UUAC	Unbilled Unmetered:	n	g	10	4.609	MG/Yr	custom	4.609	MG/Yr

AUTHORIZED CONSUMPTION: 2,195.676 MG/Yr

WATER LOSSES

552.238 MG/Yr

Apparent Losses

Default option selected for Systematic Data Handling Errors, with automatic data grading of 3

		n	g				choose entry option:		
SDHE	Systematic Data Handling Errors:	n	g	3	5.430	MG/Yr	0.25%	default	
CMI	Customer Metering Inaccuracies:	n	g	9	17.670	MG/Yr	0.80%	percent	under-registration
UC	Unauthorized Consumption:	n	g	3	5.430	MG/Yr	0.25%	default	

Default option selected for Unauthorized Consumption, with automatic data grading of 3

Apparent Losses: 28.529 MG/Yr

Real Losses

Real Losses: 523.709 MG/Yr

WATER LOSSES: 552.238 MG/Yr

NON-REVENUE WATER

NON-REVENUE WATER: 576.113 MG/Yr

SYSTEM DATA

		n	g				
Lm	Length of mains:	n	g	7	394.0	miles	(including fire hydrant lead lengths)
Nc	Number of service connections:	n	g	5	22,287		(active *and* inactive)
	Service connection density:				57	conn./mile main	

Are customer meters typically located at the curbstop/property line? Yes

Lp: n g 10

Average length of customer service line has been set to zero and a data grading of 10 has been applied

AOP: Average Operating Pressure: n g 9 — 118.5 psi

COST DATA

		n	g					
CRUC	Customer Retail Unit Charge:	n	g	9	$2.91	$/1000 gallons (US)	Total Annual Operating Cost	
VPC	Variable Production Cost:	n	g	8	$482.01	$/Million gallons		$/yr (optional input)

WATER AUDIT DATA VALIDITY TIER:

***** The Water Audit Data Validity Score is in Tier IV (71-90). See Dashboard tab for additional outputs. ***** go to dashboard

A weighted scale for the components of supply, consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION TO IMPROVE DATA VALIDITY:

Based on the information provided, audit reliability can be most improved by addressing the following components:

1: Volume from Own Sources (VOS)
2: Billed Metered (BMAC)
3: Number of Service Connections (Nc)

KEY PERFORMANCE INDICATOR TARGETS:

OPTIONAL: If targets exist for the operational performance indicators, they can be input below:

Unit Total Losses:		gal/conn/day
Unit Apparent Losses:		gal/conn/day
Unit Real Losses[A]:		gal/conn/day
Unit Real Losses[B]:		gal/mile/day

If entered above by user, targets will display on KPI gauges (see Dashboard)

FWAS v6.0

AWWA Free Water Audit Software: Dashboard

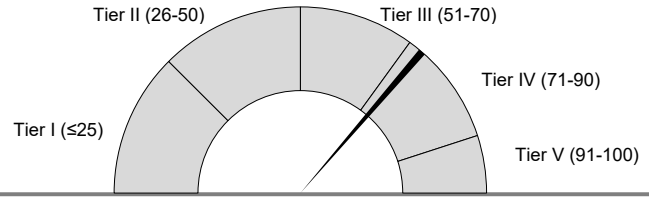
go to worksheet | go to grading | go to references

Water Audit Report for: Cumming Utilities - City of Cumming, GA **Audit Year:** 2021 **Fiscal** Jan 01 2021 - Dec 31 2021

Data Validity

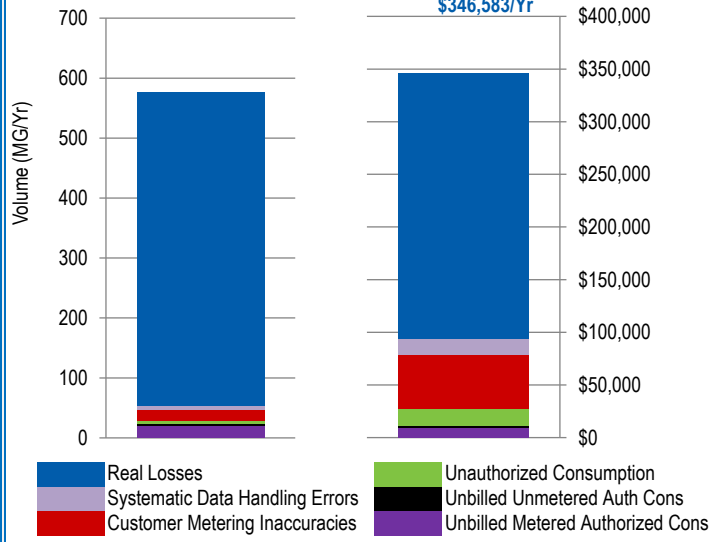
Data Validity Score: 72 **Data Validity Tier:** Tier IV (71-90)

See Loss Control Planning for Tier Details



NRW Components Summary

Total Volume of NRW = 576 MG/Yr **Total Cost of NRW = $346,583/Yr**

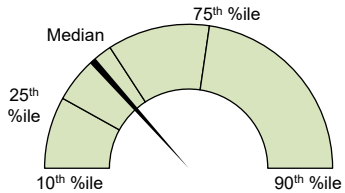


	Volume MG/Yr	Value $/Yr	Basis of Valuation
Apparent Losses	28.5	$82,642	CRUC
Real Losses	523.7	$252,433	VPC
Unbilled Authorized Cons	23.9	$11,508	VPC
Non-Revenue Water	576.1	$346,583	Blended

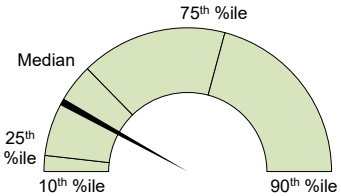
Key Performance Indicators

Actual KPI result | Target (see Worksheet)

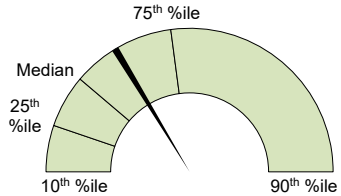
gauge %iles per validated industry ranges[2]



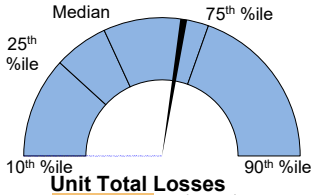
Total Loss Cost Rate
15.03 $/conn/year



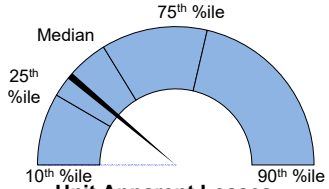
Apparent Loss Cost Rate
3.71 $/conn/year



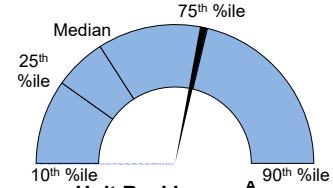
Real Loss Cost Rate
11.33 $/conn/year



Unit Total Losses
67.9 gal/conn/day

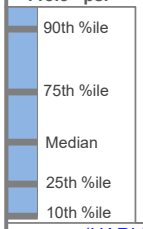


Unit Apparent Losses
3.5 gal/conn/day

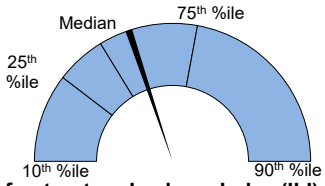


Unit Real Losses[A]
64.4 gal/conn/day

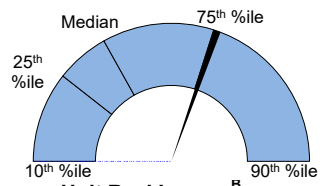
Average Operating Pressure
118.5 psi



AOP is above 90th %ile



Infrastructure Leakage Index (ILI)
2.2 dimensionless



Unit Real Losses[B]
3,642 gal/mile/day

See UARL definition for additional guidance on the ILI

(UARL) Unavoidable Annual Real Losses	236.8 MG/Yr	29.1 gal/conn/day

Guidance Information for Key Performance Indicators

- The eight indicators shown are the recommended suite per the AWWA Water Loss Control Committee 2020 Position on KPIs[1].
- A suite of KPIs is necessary, as no single KPI can holistically communicate water loss performance for a given water system.
- See Table 1 below for Uses and Limitations for each KPI, excerpted from the AWWA Water Loss Control Committee Report (2020)[1], with naming conventions updated.
- Percentiles (%iles) shown on KPI gauges come from Level 1 validated data in the AWWA WLCC Reference Water Audit Dataset (2020)[2].
- KPI %iles shown above are not segregated by cohorts. Limited KPI data by cohorts may be found in WRF 4695 Guidance Manual, Appendix B (2019)[5].
- Actual KPI results that fall below 10th %ile or above 90th %ile do not necessarily imply error, but should be viewed with scrutiny.
- Percentiles not intended to imply targets. Targets may be input by user for operational KPIs, if desired, on Worksheet.
- See UARL and ILI in Definitions tab for discussion of size and pressure limitations.
- Systems that fall on the extreme ends of size or connection density should use caution when interpreting Unit Losses KPIs.

AWWA Free Water Audit Software
Water Balance

FWAS v6.0

Water Audit Report for: Cumming Utilities - City of Cumming, GA
Audit Year: 2021 Jan 01 2021 - Dec 31 2021
Data Validity Tier: Tier IV (71-90)

		Water Exported (WE) (corrected for known errors) 452.812	Billed Water Exported			Revenue Water (Exported) 452.812
Volume from Own Sources (VOS) (corrected for known errors) 3,200.638	System Input Volume 3,200.726	Water Supplied 2,747.915	Authorized Consumption 2,195.676	Billed Authorized Consumption 2,171.801	Billed Metered Consumption (BMAC) (water exported is removed) 2,171.801	Revenue Water 2,171.801
					Billed Unmetered Consumption (BUAC) 0.000	
				Unbilled Authorized Consumption 23.875	Unbilled Metered Consumption (UMAC) 19.267	Non-Revenue Water (NRW) 576.113
					Unbilled Unmetered Consumption (UUAC) 4.609	
			Water Losses 552.238	Apparent Losses 28.529	Systematic Data Handling Errors (SDHE) 5.430	
					Customer Metering Inaccuracies (CMI) 17.670	
					Unauthorized Consumption (UC) 5.430	
Water Imported (WI) (corrected for known errors) 0.089				Real Losses 523.709	Leakage on Transmission and/or Distribution Mains Not broken down	
					Leakage and Overflows at Utility's Storage Tanks Not broken down	
					Leakage on Service Connections Not broken down	

AWWA Free Water Audit Software: Determining Water Loss Standing

Water Audit Report for: Cumming Utilities - City of Cumming, GA
Audit Year: 2021 Jan 01 2021 - Dec 31 2021
Data Validity Tier: Tier IV (71-90)

Water Loss Control Planning Guide

	Water Audit Data Validity Tier (Score Range)				
Functional Focus Area	**Tier I (1-25)**	**Tier II (26-50)**	**Tier III (51-70)**	**Tier IV (71-90)**	**Tier V (91-100)**
Audit Data Collection	Launch auditing and loss control team; address supply metering deficiencies	Analyze business process for customer metering and billing functions and water supply operations; Identify data gaps; improve supply metering	Establish/revise policies and procedures for data collection	Refine data collection practices and establish as routine business process	Annual water audit is a reliable gauge of year-to-year water efficiency standing
Short-term loss control	Research information on leak detection programs; Begin flowcharting analysis of customer billing system	Conduct loss assessment investigations on a sample portion of the system: customer meter testing, leak survey, unauthorized consumption, etc	Establish ongoing mechanisms for customer meter accuracy testing, active leakage control and infrastructure monitoring	Refine, enhance or expand ongoing programs based upon economic justification	Stay abreast of improvements in metering, meter reading, billing, leakage management and infrastructure rehabilitation
Long-term loss control		Begin to assess long-term needs requiring large expenditure: customer meter replacement, water main replacement program, new customer billing system or AMR/AMI system	Begin to assemble economic business case for long-term needs based upon improved data becoming available through the water audit process	Conduct detailed planning, budgeting and launch of comprehensive improvements for metering, billing or infrastructure management	Continue incremental improvements in short-term and long-term loss control interventions
Target-setting			Establish long-term apparent and real loss reduction goals (+10 year horizon)	Establish mid-range (5 year horizon) apparent and real loss reduction goals	Evaluate and refine loss control goals on a yearly basis
Benchmarking			Preliminary Comparisons - can begin to rely upon with PIs for performance comparisons for real losses	Performance Benchmarking with PIs is meaningful in comparing real loss standing	Identify Best Practices/ Best in class; PIs are very reliable as real loss performance indicators for best in class service

For validity scores of 50 or below, the shaded blocks should not be focus areas until better data validity is achieved.

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Water Loss Control Program Template

Audit Recommendation Area #1: Volume from Own Source (VOS)

Performance Measure: Level and frequency of secondary and tertiary metering device test
Current Status: Annually test for secondary device
Goal: Semi-annual test for secondary and tertiary device

Proposed Actions	Anticipated Beginning Date	Projected Completion Date
Increase the frequency of testing;	June, 2022	December, 2022
Test secondary and tertiary device.	June, 2022	December, 2022

Notes / Comments:
1. Flow meter: The flow meters that Cumming uses are BIF venturi meters. Per the manufacturer, the meters are 0.5% accurate as manufactured. As the meters are measuring finished water with little abrasion, no change in accuracy is expected over a long period of time.
2. Differential Transmitter (Secondary Device): Cumming has the differential pressure transmitters calibrated twice a year. The procedures followed are industry standard.
3. Communications between DP transmitter and the SCADA (Tertiary Device): The communications between DP transmitter and the SCADA should be tested and calibrated.

Audit Recommendation Area #2: Billed Metered (BMAC)

Performance Measure: Unit total loss
Current Status: 67.9 gal/conn/day
Goal: 35.0 gal/conn/day

Proposed Actions	Anticipated Beginning Date	Projected Completion Date
Provide review for the billing system by someone who is independent of the billing process to reduce apparent loss; Replace leaking water lines to reduce real loss; Provide more accurate system pressure from City of Cumming water model.	June, 2022	December, 2025

Notes / Comments:

Audit Recommendation Area #3: Number of Services Connections (Nc)

Performance Measure: Field validation
Current Status: No field validation is conducted
Goal: Start field validation

Proposed Actions	Anticipated Beginning Date	Projected Completion Date
Start to conduct field validation for a portion of the system.	June, 2022	December, 2025

Notes / Comments:

Other Priority Area: _____

Performance Measure: _____
Current Status: _____
Goal: _____

Proposed Actions	Anticipated Beginning Date	Projected Completion Date

Notes / Comments:

Other Priority Area: _____

Performance Measure: _____
Current Status: _____
Goal: _____

Proposed Actions	Anticipated Beginning Date	Projected Completion Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Notes / Comments:

Priority Area: _____

Notes / Comments:

Version 3 – Revised December 2020

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Georgia Environmental Protection Division
Qualified Water Loss Auditor
Certification Statement

Water Loss Audit Information:

Water System Name: Cumming Utilities – City of Cumming, GA

Water System No. (PWS ID #): 1170000

Water Loss Audit Year: 2021

Certified Data Validity Score: 72 Certified Real Loss (gal/conn/day): 64.40

Water System Primary Contact Information:

Name: Jonathon Heard

Email: jon.heard@cityofcumming.net Phone: 404-379-4641

Certification Statement:

I hereby certify that:

1. I HAVE CONDUCTED A LEVEL 1 VALIDATION REVIEW OF THE ABOVE REFERENCED WATER LOSS AUDIT AND THE RESULTS MEET THE REQUIREMENTS IN THE GEORGIA WATER SYSTEM AUDITS AND WATER LOSS CONTROL MANUAL AND THE AMERICAN WATER WORKS ASSOCIATION METHODOLOGY FOR WATER LOSS AUDITING.

2. THE BASIS OF AUDIT DOCUMENTATION FOR THE ABOVE REFERENCED WATER LOSS AUDIT IS INCLUDED EITHER IN THE COMMENTS TAB OF THE AUDIT FILE OR ATTACHED IN COMPARABLE FORMAT.

Qualified Water Loss Auditor (QWLA) Information:

First & Last Name (print): Muyun Ye

Phone: 412-999-6976 Email: mandy@cecincga.com

QWLA Registration Number: 263

QWLA Signature: Muyun Ye

Signature Date: 2/28/2022

Supplemental information to be provided, if available, by Primary Contact listed above:

Total volume of residential water use for audit year (million gallons): 1,308.33

APPENDIX G
MNGWPD AUDIT COMPLIANCE AND SURVEY

GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Richard E. Dunn, Director

Watershed Protection Branch
2 Martin Luther King, Jr. Drive
Suite 1152, East Tower
Atlanta, Georgia 30334
404-463-1511

Troy Brumbalow, Mayor
City of Cumming
100 Main Street
Cumming, GA 30040

JAN 2 1 2021

RE: Metropolitan North Georgia Water Planning District Audit

Dear Mayor Brumbalow:

The Metropolitan North Georgia Water Planning District (District http://northgeorgiawater.org) was established by the Georgia legislature in 2001 to develop comprehensive regional and watershed-specific plans for the 15-county metro Atlanta region. In June 2017, the District adopted the Water Resource Management Plan (http://northgeorgiawater.org/plans-manuals/). This plan contains a number of requirements that each local government within the District must meet in order to help protect water quality and public water supplies, as well as minimize potential adverse impacts of development on waters in and downstream of the District.

OCGA 12-5-582 (e) (3), OCGA 12-5-583 (e) (3), and OCGA 12-5-584 (d) (3), state that the Director shall not approve any application by a local government in the District to issue or modify a permit, if such permit would allow an increase in the permitted water withdrawal, public water system capacity, or wastewater treatment system capacity of such local government, or to renew any NPDES Phase I or Phase II General Stormwater permit, unless such local government is in compliance with the applicable provisions of the plan or the Director certifies that such local government is making good faith efforts to come into such compliance. Also, any local government that fails to adopt and implement the applicable plans developed by the District shall be ineligible for state grants or loans for stormwater, wastewater, or water supply and conservation projects.

As the City of Cumming is a member of the District, EPD will be conducting an audit to ensure that your government is in compliance with the applicable Action Items within the District Plan. Please submit one copy of a completed checklist along with documentation for each action item on one USB Flash Drive and return it to our office no later than May 1, 2021. You may find the current version of the audit checklist on the EPD website located under the "Planning" header at: https://epd.georgia.gov/watershed-protection-branch

City of Cumming
RE: Metropolitan North Georgia Water Planning District Audit
Page 2 of 2

In order to complete the Audit in a timely manner, please use the following guidelines:

- Study the Water Resource Management Plan
- Locate previous Audit files; ensure that your municipality has addressed everything that was required in both the audit and the good faith effort letters.
- Locate Memoranda of Understanding (MOU) with adjacent entities, and update or create if necessary.
- Locate (or create) all necessary ordinances and/or policies.
- Provide proper documentation for every Action Item.
- Reach out to EPD with questions.
- Return Audit on time.

Please contact me at 404-463-1474 or *alys.hannum@dnr.ga.gov* should you have any questions regarding the audit process, or if you would like to set up a meeting. For more information on the District, please visit www.northgeorgiawater.org.

Sincerely,

Alys Hannum
Environmental Compliance Specialist

cc: Troy Brumbalow, Mayor *(tbrumbalow@cityofcumming.net)*
Heath Martin, Assistant to the Director *(hmartin@cummingutilities.com)*
Jimmy Andrews, Water Pollution Control Superintendent *(jimmyandrews@cityofcumming.net)*
Tom Bryson, Water Production Superintendent *(tombryson@cityofcumming.net)*
Tim Day, Distribution and Collection Division *(tday@cummingutilities.com)*
MNGWPD Technical Assistance (*technicalassistance@northgeorgiawater.com*)

APPENDIX H
INFRASTRUCTURE LIFE EXPECTANCY

Table 1: Typical Equipment Life Expectancy

Source of supply

Equipment	Life Expectancy in Years
Intake Structures	35 – 45
Wells and Springs	25 – 35
Galleries and Tunnels	30 – 40
Transmission mains	35 – 40

Pumping Plants

Equipment	Life Expectancy in Years
Structures	30 – 60
Pumping Equipment	10 – 15

Treatment Plants

Equipment	Life Expectancy in Years
Structures	30 – 60
Equipment	10 – 15
Chlorination Equipment	10 – 15

Transmission/Distribution

Equipment	Life Expectancy in Years
Structures	30 – 60
Reservoirs and Tanks	30 – 60
Mains & Distribution Pipes	35 – 40
Services	30 – 50
Valves	35 – 40
Backflow Prevention Valves	35 – 40
Blow-off valves	35 – 40
Meters	10 – 15
Hydrants	40 – 60

General Plant

Equipment	Life Expectancy in Years
Structures	30 – 40
Electrical Systems	7 – 10
Equipment	10 – 15
Transportation Equipment	10
Computers	5
Stores equipment	10
Lab/Monitoring Equipment	5 – 7
Tools and Shop Equipment	10 – 15
Landscaping/Grading	40 – 60
Power operated equipment	10 – 15
Communications equipment	10

From EPA publication EPA 816-R-03-016 Sept. 2003 (reformatted for web accessibility)

APPENDIX I
LAND USE MAPS

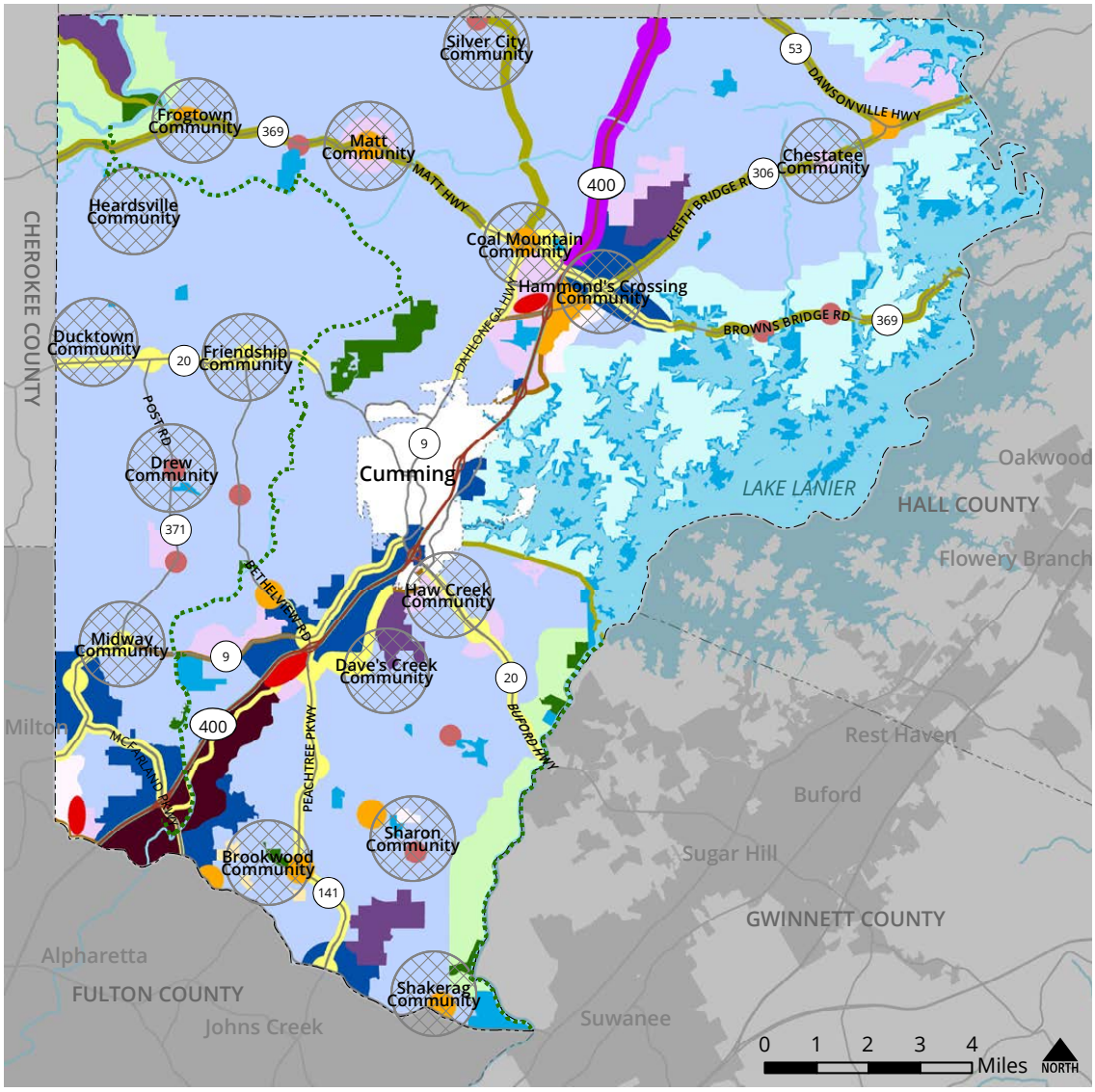


Figure A.59: Character Areas

- Development Corridor
- Neighborhood Center
- Town Center
- Regional Center
- Employment Center
- Major Highway Corridor
- Business and Retail Pkwy Corridor
- McFarland-Stoney Point LCI
- Heavy Industrial
- Lakeside Residential
- River Residential
- Estate Residential
- Suburban Living
- Suburban Attached Living
- Village Living
- Transitional Corridor
- Recreation Area
- Thoroughfare
- Conservation Area
- Conservation Area
- Community Node

Source: GIS Department, Forsyth County Georgia

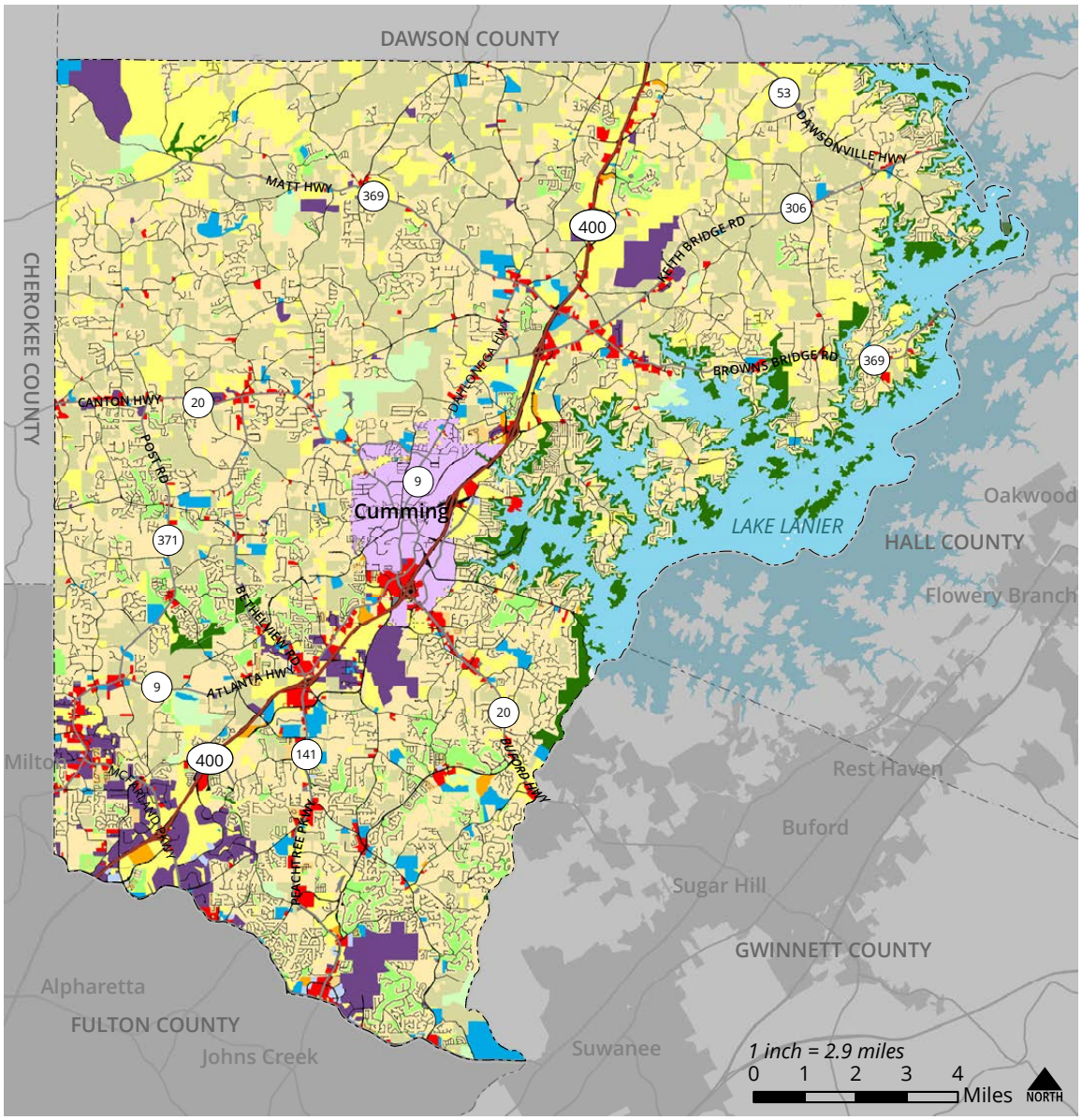
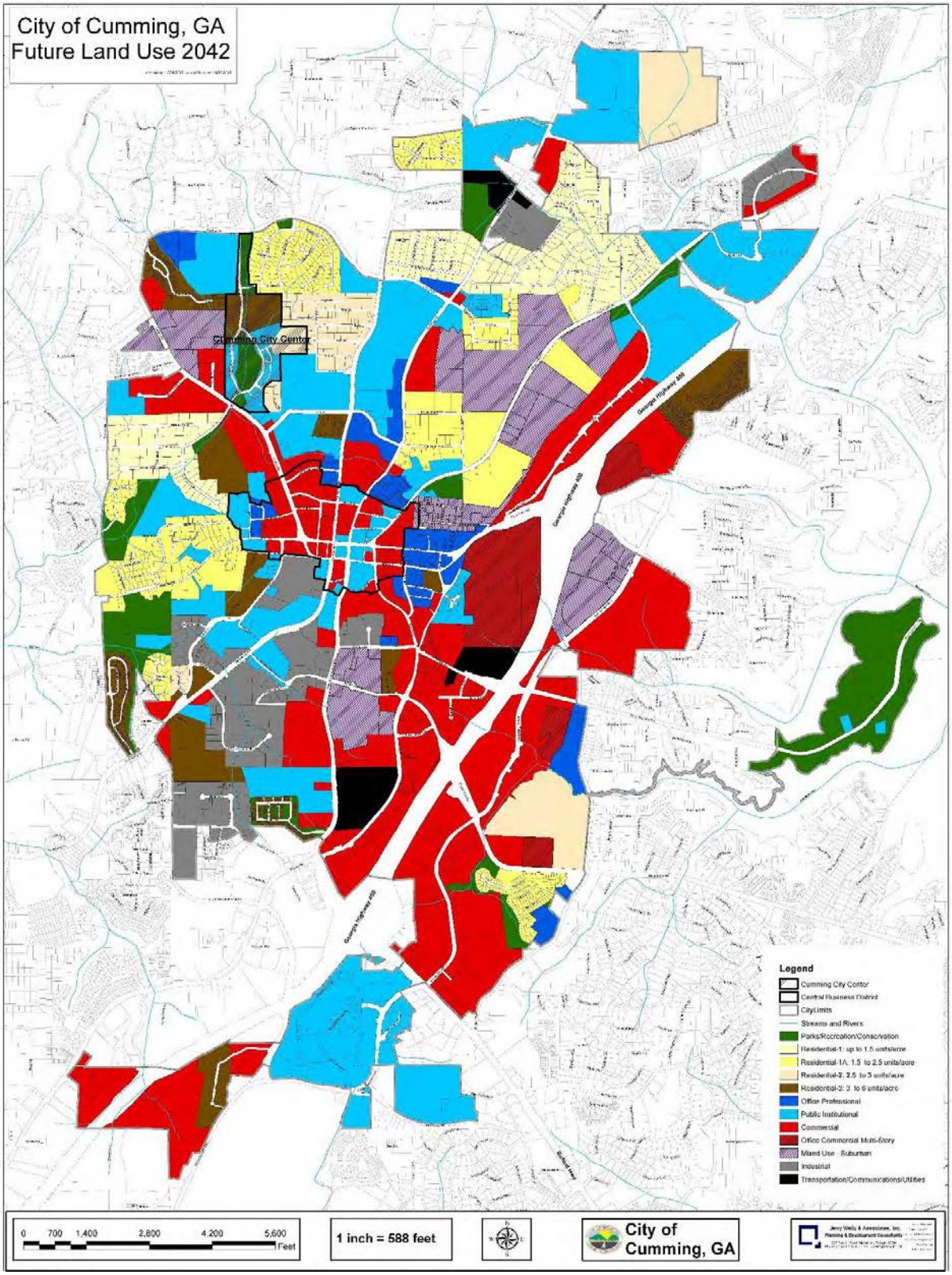
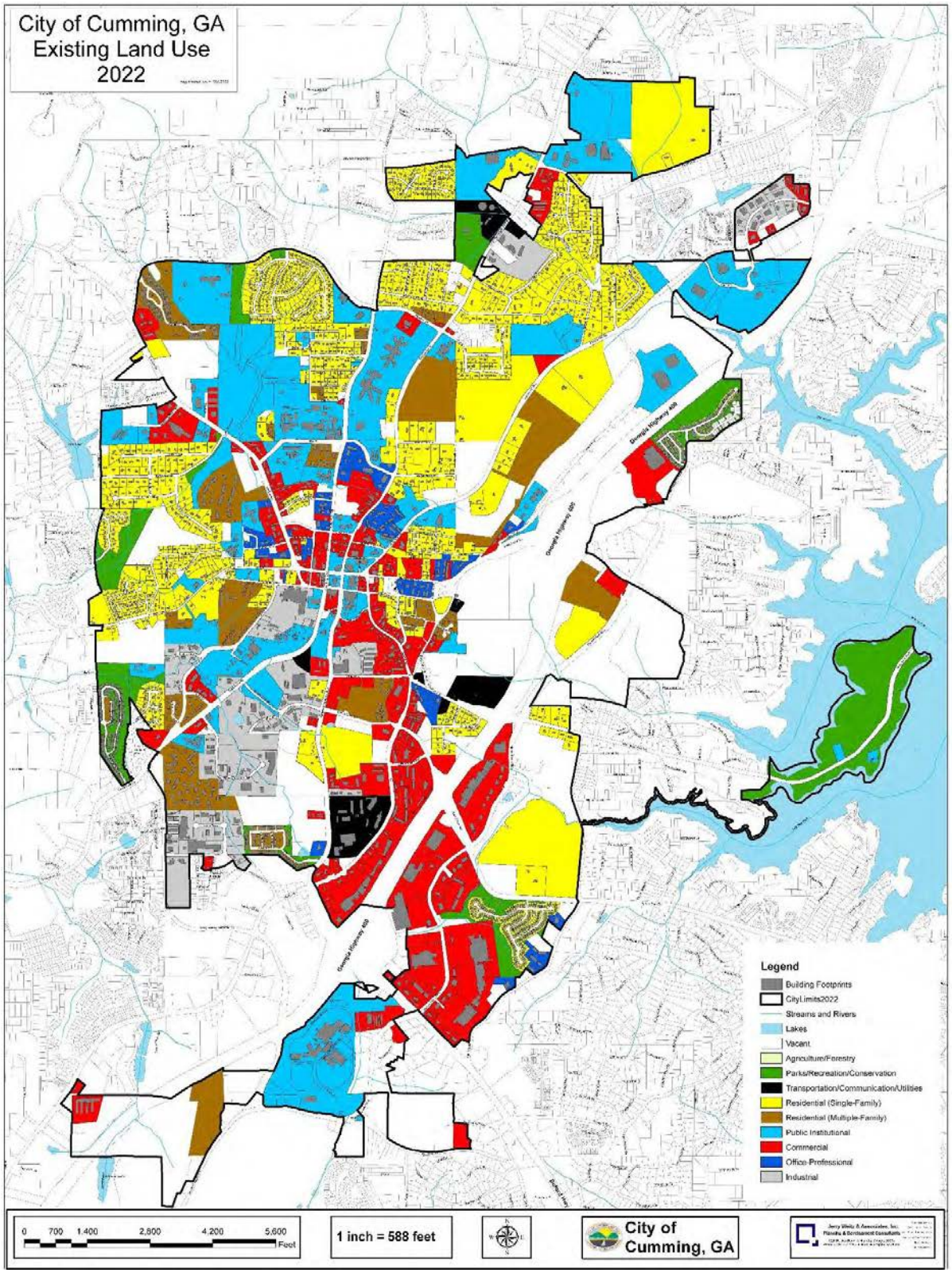


Figure A.50:Existing Land Use (2016 Update)

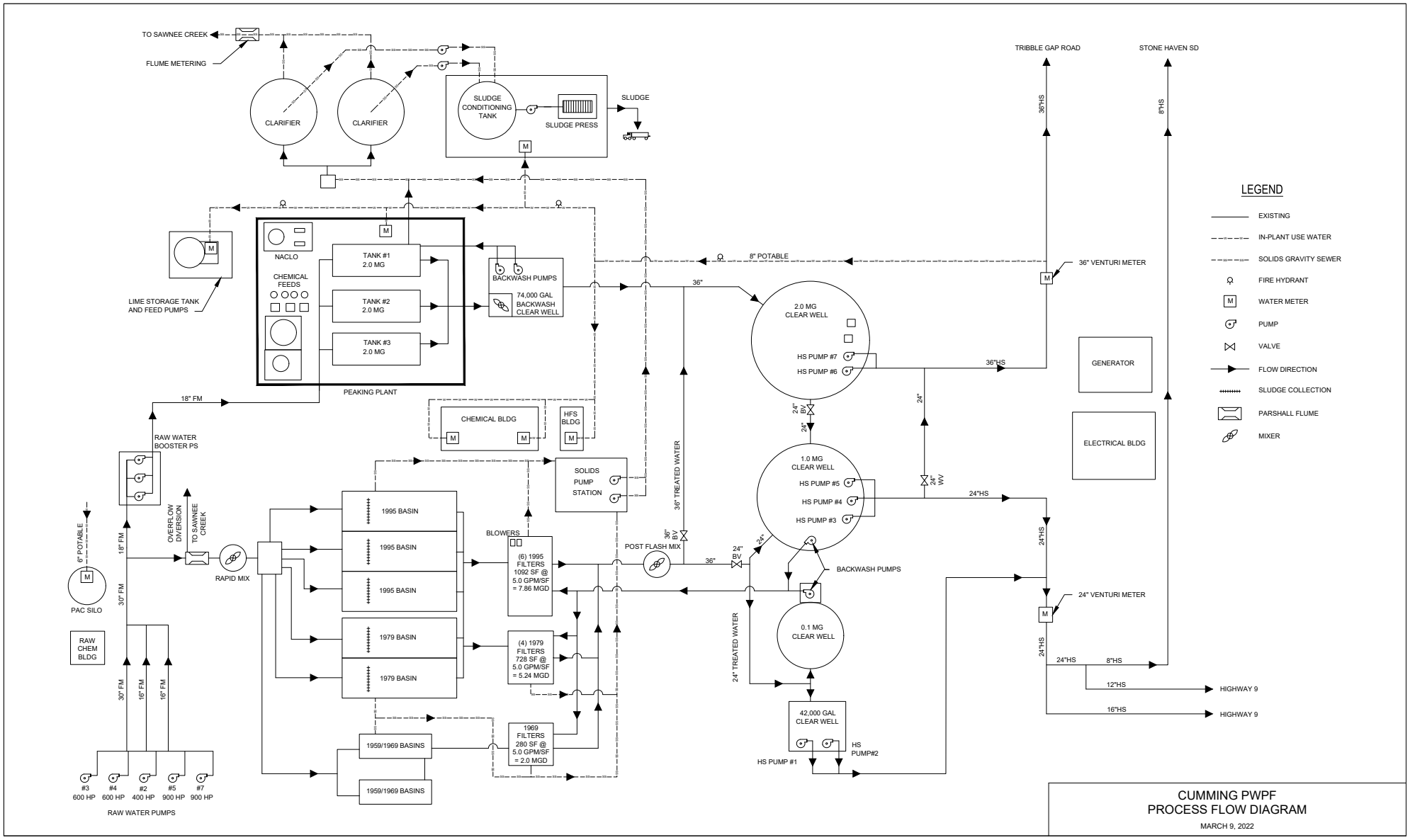
- Public Parks/Recreation
- Private Open Space
- Conservation
- Transportation/Comms/Utilities
- City of Cumming
- Right of Way
- Undeveloped
- Agriculture
- Institutional/Public
- Attached Single Family
- Detached Single Family
- Multi-Family
- Commercial
- Industrial
- Office

Chapter 3, Land Use Element
City of Cumming, GA, Comprehensive Plan, 2022-2042




City of Cumming, GA
Existing Land Use
2022
Legend
Building Footprints
CityLimits2022
Streams and Rivers
Lakes
Vacant
Agriculture/Forestry
Parks/Recreation/Conservation
Transportation/Communication/Utilities
Residential (Single-Family)
Residential (Multiple-Family)
Public Institutional
Commercial
Office-Professional
Industrial
0 700 1,400 2,800 4,200 5,600
Feet
1 inch = 588 feet
City of Cumming, GA

APPENDIX J
PWPF PROCESS FLOW DIAGRAM


TO SAWNEE CREEK
FLUME METERING
CLARIFIER
CLARIFIER
SLUDGE CONDITIONING TANK
SLUDGE PRESS
SLUDGE
TRIBBLE GAP ROAD
STONE HAVEN SD
36"HS
8"HS
LEGEND
EXISTING
IN-PLANT USE WATER
SOLIDS GRAVITY SEWER
FIRE HYDRANT
WATER METER
PUMP
VALVE
FLOW DIRECTION
SLUDGE COLLECTION
PARSHALL FLUME
MIXER
NACLO
CHEMICAL FEEDS
TANK #1 2.0 MG
TANK #2 2.0 MG
TANK #3 2.0 MG
BACKWASH PUMPS
74,000 GAL BACKWASH CLEAR WELL
8" POTABLE
36" VENTURI METER
LIME STORAGE TANK AND FEED PUMPS
PEAKING PLANT
36"
2.0 MG CLEAR WELL
HS PUMP #7
HS PUMP #6
36"HS
GENERATOR
18" FM
CHEMICAL BLDG
HFS BLDG
24" BV
24"
ELECTRICAL BLDG
RAW WATER BOOSTER PS
SOLIDS PUMP STATION
1.0 MG CLEAR WELL
HS PUMP #5
HS PUMP #4
HS PUMP #3
24" WV
24"HS
6" POTABLE
OVERFLOW DIVERSION
TO SAWNEE CREEK
BLOWERS
36" TREATED WATER
36" BV
POST FLASH MIX
24" BV
24"
1995 BASIN
1995 BASIN
1995 BASIN
(6) 1995 FILTERS 1092 SF @ 5.0 GPM/SF = 7.86 MGD
RAPID MIX
BACKWASH PUMPS
24"HS
PAC SILO
18" FM
30" FM
1979 BASIN
1979 BASIN
(4) 1979 FILTERS 728 SF @ 5.0 GPM/SF = 5.24 MGD
0.1 MG CLEAR WELL
24" TREATED WATER
24" VENTURI METER
RAW CHEM BLDG
30" FM
16" FM
16" FM
1959/1969 BASINS
1959/1969 BASINS
1969 FILTERS 280 SF @ 5.0 GPM/SF = 2.0 MGD
42,000 GAL CLEAR WELL
HS PUMP#2
HS PUMP #1
24"HS
8"HS
12"HS
HIGHWAY 9
16"HS
HIGHWAY 9
#3 600 HP
#4 600 HP
#2 400 HP
#5 900 HP
#7 900 HP
RAW WATER PUMPS
CUMMING PWPF
PROCESS FLOW DIAGRAM
MARCH 9, 2022

APPENDIX K
RARE SPECIES
& NATURAL ELEMENTS
(HEX 105, 125, 126, 147)

GEORGIA DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

GEORGIA BIODIVERSITY PORTAL

All Tracked Natural Elements

hex24_105 24 km Hexagon

All Tracked Natural Elements With or Without Protection Status

21 element records in list

ANIMALS

- ***Cambarus fasciatus*** (Etowah Crayfish), **Rank:** G3/S2, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 27, **Habitat:** Lotic habitats under rocks in flowing water PROFILE | RANGE MAP | EXPLORER
- ***Campeloma regulare*** (Cylinder campeloma), **Rank:** G4/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 12, **Habitat:** Large rivers to small streams along margins PROFILE | RANGE MAP | EXPLORER
- ***Etheostoma etowahae*** (Etowah Darter), **Rank:** G1/S1, **GA:** E, **US:** LE, **SWAP:** Yes, **EOs:** 24, **Habitat:** Moderate to high gradient streams over cobble to gravel in areas of swift current PROFILE | RANGE MAP | EXPLORER
- ***Etheostoma rupestre*** (Rock Darter), **Rank:** G4/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 20, **Habitat:** Swift rocky riffles often associated with attached vegetation such as Podostemum PROFILE | RANGE MAP | EXPLORER
- ***Etheostoma scotti*** (Cherokee Darter), **Rank:** G2/S2, **GA:** T, **US:** LT, **SWAP:** Yes, **EOs:** 102, **Habitat:** Small to medium-sized creeks with moderate current and rocky substrates PROFILE | RANGE MAP | EXPLORER
- ***Hybopsis lineapunctata*** (Lined Chub), **Rank:** G3G4/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 53, **Habitat:** Upland creeks over sandy substrate with gentle current PROFILE | RANGE MAP | EXPLORER
- ***Hybopsis sp. 9*** (Etowah Chub), **Rank:** G1Q/S1S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 12, **Habitat:** Generally in creeks and small to medium rivers over sand-silt bottom, usually in pools adjacent to riffle areas. Tends to occupy smaller streams in east than in west PROFILE | RANGE MAP | EXPLORER
- ***Macrhybopsis etnieri*** (Coosa Chub), **Rank:** G3G4/S1, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 16, **Habitat:** Fast water in large streams and rivers PROFILE | RANGE MAP | EXPLORER
- ***Myotis grisescens*** (Gray Myotis), **Rank:** G4/S1, **GA:** E, **US:** LE, **SWAP:** Yes, **EOs:** 28, **Habitat:** Caves with flowing water or with large creeks or bodies of water nearby, also storm sewers and artificial caves in other states. Unknown summer roosts-eastern GA. range. PROFILE | RANGE MAP | EXPLORER
- ***Myotis septentrionalis*** (Northern Myotis), **Rank:** G1G2/S1, **GA:** T, **US:** LT, **SWAP:** Yes, **EOs:** 66, **Habitat:** Caves and mines in winter; riparian areas, upland forests, cracks and crevices in dead and live trees in summer PROFILE | RANGE MAP | EXPLORER
- ***Noturus munitus*** (Frecklebelly Madtom), **Rank:** G3/S1, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 7, **Habitat:** Shoals and riffles of moderate to large streams and rivers PROFILE | RANGE MAP | EXPLORER
- ***Noturus nocturnus*** (Freckled Madtom), **Rank:** G5/SNA, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 2, **Habitat:** Moderate or slow current around vegetation or undercut banks of medium to large streams PROFILE | RANGE MAP | EXPLORER
- ***Ophisaurus attenuatus*** (Slender Glass Lizard), **Rank:** G5/S3, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 38, **Habitat:** Open woods; savannas; old fields; sandhills PROFILE | RANGE MAP | EXPLORER
- ***Percina antesella*** (Amber Darter), **Rank:** G1G2/S1, **GA:** E, **US:** LE, **SWAP:** Yes, **EOs:** 10, **Habitat:** Riffles and runs of medium-sized rivers, patches of sand and small gravel, riverweed PROFILE | RANGE MAP | EXPLORER
- ***Percina lenticula*** (Freckled Darter), **Rank:** G3/S2, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 7, **Habitat:** Swift deep runs of main river channels around large, woody debris, possibly over a rocky substrate PROFILE | RANGE MAP | EXPLORER
- ***Perimyotis subflavus*** (Tri-colored Bat), **Rank:** G2G3/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 164, **Habitat:** Open forests with large trees and woodland edges; roost in tree foliage; hibernate in caves or mines with high humidity PROFILE | RANGE MAP | EXPLORER
- ***Pituophis melanoleucus melanoleucus*** (Northern Pine Snake), **Rank:** G4T4/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 29, **Habitat:** Dry pine or pine-hardwood forests PROFILE | RANGE MAP | EXPLORER

NATURAL COMMUNITIES

- ***Tilia americana var. heterophylla - Fraxinus americana / Sanguinaria canadensis - (Aquilegia canadensis, Asplenium rhizophyllum) Forest*** (Southern Appalachian Cove Forest), **Rank:** G2G3/SNR, **GA:** none, **US:**

none, **SWAP:** To be determined, **EOs:** 2 PROFILE | RANGE MAP | EXPLORER

PLANTS

Schisandra glabra (Bay Star-vine), **Rank:** G3/S2, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 71, **Habitat:** Rich woods on stream terraces and lower slopes PROFILE | RANGE MAP | EXPLORER

Symphyotrichum georgianum (Georgia Aster), **Rank:** G3/S3, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 130, **Habitat:** Upland oak-hickory-pine forests and openings; sometimes with Echinacea laevigata or over amphibolite PROFILE | RANGE MAP | EXPLORER

Xerophyllum asphodeloides (Eastern Turkeybeard), **Rank:** G4/S1, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 12, **Habitat:** Xeric oak-pine forests PROFILE | RANGE MAP | EXPLORER

Exported from Biotics conservation database on June 7, 2019

GEORGIA DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

GEORGIA BIODIVERSITY PORTAL

All Tracked Natural Elements

hex24_125 24 km Hexagon

All Tracked Natural Elements With or Without Protection Status

16 element records in list

ANIMALS

- ***Cambarus howardi*** (Chattahoochee Crayfish), **Rank:** G3Q/S2, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 41, **Habitat:** riffle areas of streams; in rocks with swift-flowing water PROFILE | RANGE MAP | EXPLORER
- ***Etheostoma scotti*** (Cherokee Darter), **Rank:** G2/S2, **GA:** T, **US:** LT, **SWAP:** Yes, **EOs:** 102, **Habitat:** Small to medium-sized creeks with moderate current and rocky substrates PROFILE | RANGE MAP | EXPLORER
- ***Haliaeetus leucocephalus*** (Bald Eagle), **Rank:** G5/S3, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 267, **Habitat:** Edges of lakes and large rivers; seacoasts PROFILE | RANGE MAP | EXPLORER
- ***Lamropeltis rhombomaculata*** (Mole Kingsnake), **Rank:** G5/SNR, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 55, **Habitat:** Georgia habitat information not available PROFILE | RANGE MAP | EXPLORER
- ***Micropterus cataractae*** (Shoal Bass), **Rank:** G3/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 72, **Habitat:** Large river, shoal and fluvial specialist PROFILE | RANGE MAP | EXPLORER

PLANTS

- ***Amorpha nitens*** (Shining Indigo-bush), **Rank:** G3?/S1?, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 22, **Habitat:** Rocky, wooded slopes; alluvial woods PROFILE | RANGE MAP | EXPLORER
- ***Amorpha schwerinii*** (Schwerin's Indigo-bush), **Rank:** G3G4/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 8, **Habitat:** Rocky upland woods PROFILE | RANGE MAP | EXPLORER
- ***Cypripedium acaule*** (Pink Ladyslipper), **Rank:** G5/S4, **GA:** U, **US:** none, **SWAP:** No, **EOs:** 201, **Habitat:** Upland oak-hickory-pine forests; piney woods PROFILE | RANGE MAP | EXPLORER
- ***Hydrastis canadensis*** (Goldenseal), **Rank:** G3G4/S2, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 19, **Habitat:** Rich woods in circumneutral soil PROFILE | RANGE MAP | EXPLORER
- ***Panax quinquefolius*** (American Ginseng), **Rank:** G3G4/S3, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 141, **Habitat:** Mesic hardwood forests; cove hardwood forests PROFILE | RANGE MAP | EXPLORER
- ***Platanthera integrilabia*** (Monkeyface Orchid), **Rank:** G2G3/S1S2, **GA:** T, **US:** LT, **SWAP:** Yes, **EOs:** 12, **Habitat:** Red maple-gum swamps; peaty seeps and streambanks with Parnassia asarifolia and Oxypolis rigidior PROFILE | RANGE MAP | EXPLORER
- ***Polygala senega*** (Seneca Snakeroot), **Rank:** G4G5/S2?, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 4, **Habitat:** Georgia habitat information not available PROFILE | RANGE MAP | EXPLORER
- ***Schisandra glabra*** (Bay Star-vine), **Rank:** G3/S2, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 71, **Habitat:** Rich woods on stream terraces and lower slopes PROFILE | RANGE MAP | EXPLORER
- ***Symphyotrichum georgianum*** (Georgia Aster), **Rank:** G3/S3, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 130, **Habitat:** Upland oak-hickory-pine forests and openings; sometimes with Echinacea laevigata or over amphibolite PROFILE | RANGE MAP | EXPLORER
- ***Veratrum woodii*** (Ozark Bunchflower), **Rank:** G5/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 29, **Habitat:** Mesic hardwood forests over basic soils PROFILE | RANGE MAP | EXPLORER
- ***Waldsteinia lobata*** (Piedmont Barren Strawberry), **Rank:** G3/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 41, **Habitat:** Stream terraces and adjacent gneiss outcrops PROFILE | RANGE MAP | EXPLORER

Exported from Biotics conservation database on June 7, 2019

GEORGIA DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

GEORGIA BIODIVERSITY PORTAL

All Tracked Natural Elements

hex24_126 24 km Hexagon

All Tracked Natural Elements With or Without Protection Status

26 element records in list

ANIMALS

- *Cambarus fasciatus* (Etowah Crayfish), **Rank:** G3/S2, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 27, **Habitat:** Lotic habitats under rocks in flowing water PROFILE | RANGE MAP | EXPLORER
- *Etheostoma brevirostrum* (Holiday Darter), **Rank:** G2/S1, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 22, **Habitat:** Small creeks to moderate sized rivers in gravel and bedrock pools PROFILE | RANGE MAP | EXPLORER
- *Etheostoma etowahae* (Etowah Darter), **Rank:** G1/S1, **GA:** E, **US:** LE, **SWAP:** Yes, **EOs:** 24, **Habitat:** Moderate to high gradient streams over cobble to gravel in areas of swift current PROFILE | RANGE MAP | EXPLORER
- *Etheostoma rupestre* (Rock Darter), **Rank:** G4/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 20, **Habitat:** Swift rocky riffles often associated with attached vegetation such as Podostemum PROFILE | RANGE MAP | EXPLORER
- *Etheostoma scotti* (Cherokee Darter), **Rank:** G2/S2, **GA:** T, **US:** LT, **SWAP:** Yes, **EOs:** 102, **Habitat:** Small to medium-sized creeks with moderate current and rocky substrates PROFILE | RANGE MAP | EXPLORER
- *Hybopsis sp. 9* (Etowah Chub), **Rank:** G1Q/S1S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 12, **Habitat:** Generally in creeks and small to medium rivers over sand-silt bottom, usually in pools adjacent to riffle areas. Tends to occupy smaller streams in east than in west PROFILE | RANGE MAP | EXPLORER
- *Macrhybopsis etnieri* (Coosa Chub), **Rank:** G3G4/S1, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 16, **Habitat:** Fast water in large streams and rivers PROFILE | RANGE MAP | EXPLORER
- *Micropterus cataractae* (Shoal Bass), **Rank:** G3/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 72, **Habitat:** Large river, shoal and fluvial specialist PROFILE | RANGE MAP | EXPLORER
- *Myotis septentrionalis* (Northern Myotis), **Rank:** G1G2/S1, **GA:** T, **US:** LT, **SWAP:** Yes, **EOs:** 66, **Habitat:** Caves and mines in winter; riparian areas, upland forests, cracks and crevices in dead and live trees in summer PROFILE | RANGE MAP | EXPLORER
- *Noturus munitus* (Frecklebelly Madtom), **Rank:** G3/S1, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 7, **Habitat:** Shoals and riffles of moderate to large streams and rivers PROFILE | RANGE MAP | EXPLORER
- *Ophisaurus attenuatus* (Slender Glass Lizard), **Rank:** G5/S3, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 38, **Habitat:** Open woods; savannas; old fields; sandhills PROFILE | RANGE MAP | EXPLORER
- *Percina antesella* (Amber Darter), **Rank:** G1G2/S1, **GA:** E, **US:** LE, **SWAP:** Yes, **EOs:** 10, **Habitat:** Riffles and runs of medium-sized rivers, patches of sand and small gravel, riverweed PROFILE | RANGE MAP | EXPLORER
- *Percina lenticula* (Freckled Darter), **Rank:** G3/S2, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 7, **Habitat:** Swift deep runs of main river channels around large, woody debris, possibly over a rocky substrate PROFILE | RANGE MAP | EXPLORER
- *Perimyotis subflavus* (Tri-colored Bat), **Rank:** G2G3/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 164, **Habitat:** Open forests with large trees and woodland edges; roost in tree foliage; hibernate in caves or mines with high humidity PROFILE | RANGE MAP | EXPLORER
- *Peucaea aestivalis* (Bachman's Sparrow), **Rank:** G3/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 338, **Habitat:** Open pine or oak woods; old fields; brushy areas, young large grassy pine regeneration areas PROFILE | RANGE MAP | EXPLORER
- *Pituophis melanoleucus melanoleucus* (Northern Pine Snake), **Rank:** G4T4/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 29, **Habitat:** Dry pine or pine-hardwood forests PROFILE | RANGE MAP | EXPLORER

PLANTS

- *Calycanthus brockiana* (Brock Sweetshrub), **Rank:** G1?Q/SU, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 1, **Habitat:** Mesic hardwood forests PROFILE | RANGE MAP | EXPLORER
- *Carex torta* (Twisted Sedge), **Rank:** G5/S1?, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 7, **Habitat:** Rocky streambeds PROFILE | RANGE MAP | EXPLORER

Cypripedium acaule (Pink Ladyslipper), **Rank:** G5/S4, **GA:** U, **US:** none, **SWAP:** No, **EOs:** 201, **Habitat:** Upland oak-hickory-pine forests; piney woods PROFILE | RANGE MAP | EXPLORER

Cypripedium parviflorum (Yellow Ladyslipper), **Rank:** G5/S3, **GA:** R, **US:** none, **SWAP:** No, **EOs:** 83, **Habitat:** Montane cove forests; rich deciduous forests PROFILE | RANGE MAP | EXPLORER

Juncus gymnocarpus (Naked-fruit Rush), **Rank:** G4/S2S3, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 33, **Habitat:** Seepy streamsides; open swamps; mountain bogs PROFILE | RANGE MAP | EXPLORER

Panax quinquefolius (American Ginseng), **Rank:** G3G4/S3, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 141, **Habitat:** Mesic hardwood forests; cove hardwood forests PROFILE | RANGE MAP | EXPLORER

Panax trifolius (Dwarf Ginseng), **Rank:** G5/S1, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 6, **Habitat:** Mesic hardwood-coniferous forests PROFILE | RANGE MAP | EXPLORER

Schisandra glabra (Bay Star-vine), **Rank:** G3/S2, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 71, **Habitat:** Rich woods on stream terraces and lower slopes PROFILE | RANGE MAP | EXPLORER

Waldsteinia lobata (Piedmont Barren Strawberry), **Rank:** G3/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 41, **Habitat:** Stream terraces and adjacent gneiss outcrops PROFILE | RANGE MAP | EXPLORER

Xerophyllum asphodeloides (Eastern Turkeybeard), **Rank:** G4/S1, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 12, **Habitat:** Xeric oak-pine forests PROFILE | RANGE MAP | EXPLORER

Exported from Biotics conservation database on June 7, 2019

GEORGIA DEPARTMENT OF NATURAL RESOURCES
WILDLIFE RESOURCES DIVISION

GEORGIA BIODIVERSITY PORTAL

All Tracked Natural Elements

hex24_147 24 km Hexagon

All Tracked Natural Elements With or Without Protection Status

13 element records in list

ANIMALS

- *Cambarus howardi* (Chattahoochee Crayfish), **Rank:** G3Q/S2, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 41, **Habitat:** riffle areas of streams; in rocks with swift-flowing water PROFILE | RANGE MAP | EXPLORER
- *Haliaeetus leucocephalus* (Bald Eagle), **Rank:** G5/S3, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 267, **Habitat:** Edges of lakes and large rivers; seacoasts PROFILE | RANGE MAP | EXPLORER
- *Moxostoma sp. 1* (Apalachicola Redhorse), **Rank:** G3/S3, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 32, **Habitat:** Pools, runs, and riffles (shoals) of large rivers and their tributaries PROFILE | RANGE MAP | EXPLORER
- *Perimyotis subflavus* (Tri-colored Bat), **Rank:** G2G3/S2, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 164, **Habitat:** Open forests with large trees and woodland edges; roost in tree foliage; hibernate in caves or mines with high humidity PROFILE | RANGE MAP | EXPLORER
- *Spilogale putorius* (Eastern Spotted Skunk), **Rank:** G4/S3, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 13, **Habitat:** Brushy, rocky, wooded habitats; avoids wetlands PROFILE | RANGE MAP | EXPLORER
- *Tyto alba* (Barn owl), **Rank:** G5/SU, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 32, **Habitat:** Nests in large hollow trees or old buildings (paticularly cement silos) in areas with extensive pasture or grassland or other open habitats such as marsh. PROFILE | RANGE MAP | EXPLORER

PLANTS

- *Cypripedium acaule* (Pink Ladyslipper), **Rank:** G5/S4, **GA:** U, **US:** none, **SWAP:** No, **EOs:** 201, **Habitat:** Upland oak-hickory-pine forests; piney woods PROFILE | RANGE MAP | EXPLORER
- *Hydrastis canadensis* (Goldenseal), **Rank:** G3G4/S2, **GA:** E, **US:** none, **SWAP:** Yes, **EOs:** 19, **Habitat:** Rich woods in circumneutral soil PROFILE | RANGE MAP | EXPLORER
- *Nestronia umbellula* (Indian Olive), **Rank:** G4/S3, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 55, **Habitat:** Mixed with dwarf shrubby heaths in oak-hickory-pine woods; often in transition areas between flatwoods and uplands PROFILE | RANGE MAP | EXPLORER
- *Polygala senega* (Seneca Snakeroot), **Rank:** G4G5/S2?, **GA:** none, **US:** none, **SWAP:** No, **EOs:** 4, **Habitat:** Georgia habitat information not available PROFILE | RANGE MAP | EXPLORER
- *Symphyotrichum georgianum* (Georgia Aster), **Rank:** G3/S3, **GA:** T, **US:** none, **SWAP:** Yes, **EOs:** 130, **Habitat:** Upland oak-hickory-pine forests and openings; sometimes with Echinacea laevigata or over amphibolite PROFILE | RANGE MAP | EXPLORER
- *Thermopsis fraxinifolia* (Ash-leaf Bush-pea), **Rank:** G3?/S2?, **GA:** none, **US:** none, **SWAP:** Yes, **EOs:** 15, **Habitat:** Oak and oak-pine ridge forests PROFILE | RANGE MAP | EXPLORER
- *Veratrum woodii* (Ozark Bunchflower), **Rank:** G5/S2, **GA:** R, **US:** none, **SWAP:** Yes, **EOs:** 29, **Habitat:** Mesic hardwood forests over basic soils PROFILE | RANGE MAP | EXPLORER

Exported from Biotics conservation database on June 7, 2019

APPENDIX L
303D IMPAIRED STREAMS

2022 Integrated 305(b)/303(d) List - Lakes

Reach Name/ID	Reach Location/County	River Basin/ Use	Assessment/ Data Provider	Cause/ Source	Size/Unit	Category/ Priority	Notes
Sand Hill Lake (previously known as Treutlen County PFA)	Treutlen County	Altamaha	Not Supporting	Fish Tissue (Mercury)	166	4a	TMDL completed Fish Tissue (Mercury) 2002.
GAR030701070406	Treutlen	Fishing	1	NP	Acres		
Andrews Lake	2 Miles Downstream Lake W.F. George Dam to Lake Andrews Dam	Chattahoochee	Assessment Pending		750	3	The water is in Category 3 for Fish Tissue (Mercury) because the Trophic Weighted Residue concentration is between 0.25 and 0.30 mg/kg.
GAR031300040708	Clay, Early	Fishing	1,33		Acres		
Dog River Reservoir	Douglas County	Chattahoochee	Supporting		225	1	
GAR031300020336	Douglas	Drinking Water, Fishing	1,16		Acres		
Franklin Lake	F.D. Roosevelt State Park	Chattahoochee	Supporting		29	1	
GAR031300021204	Harris	Fishing, Recreation	58		Acres		
Goat Rock Lake	Harris County	Chattahoochee	Not Supporting	Fish Tissue (PCBs)	941	4a	TMDL completed Fish Tissue (PCBs) 1998. The water is supporting its Drinking Water and Recreation Uses, but not its Fishing Use.
GAR031300021305	Harris	Drinking Water, Recreation, Fishing	1	NP	Acres		
Harding Lake	Bartletts Ferry, Harris County	Chattahoochee	Not Supporting	Fish Tissue (PCBs)	5851	4a	TMDL completed Fish Tissue (PCBs) 1998. The water is supporting its Drinking Water and Recreation Uses, but not its Fishing Use.
GAR031300021102	Harris	Drinking Water, Recreation, Fishing	1,33,37	NP	Acres		
Kolomoki Lake	Kolomoki Mounds State Park, Early County	Chattahoochee	Supporting		57	1	
GAR031300040202	Early	Fishing, Recreation	1,58		Acres		
Lanier Lake	Browns Bridge Road (SR 369)	Chattahoochee	Not Supporting	Chlorophyll a	6201	4a	TMDL completed Chlorophyll a 2018. Fish Tissue (Mercury) is in Category 3 because the Trophic Weighted Residue concentration is between 0.25 and 0.30 mg/kg.
GAR031300010819	Forsyth, Hall	Drinking Water, Recreation, Fishing	1,77	NP, UR	Acres		
Lanier Lake	Little River Branch	Chattahoochee	Assessment Pending		2091	2	The water is supporting its Drinking Water and Recreation uses, but is in Catgegory 3 for its Fishing use. The Fishing use is in Category 3 for Fish Tissue (Mercury) because the Trophic Weighted Residue concentration is between 0.25 and 0.30 mg/kg.
GAR031300010408	Hall	Drinking Water, Recreation, Fishing	1		Acres		

2022 Integrated 305(b)/303(d) List - Lakes

Reach Name/ID	Reach Location/County	River Basin/ Use	Assessment/ Data Provider	Cause/ Source	Size/Unit	Category/ Priority	Notes
Lanier Lake	Lanier Bridge Road (SR53)	Chattahoochee	Not Supporting	Chlorophyll a	4195	4a	TMDL completed Chlorophyll a 2018. Fish Tissue (Mercury) is in Category 3 because the Trophic Weighted Residue concentration is between 0.25 and 0.30 mg/kg.
GAR031300010818	Hall, Forsyth	Drinking Water, Recreation, Fishing	1,77	NP, UR	Acres		
Lanier Lake	Flowery Branch	Chattahoochee	Not Supporting	Chlorophyll a	10102	4a	TMDL completed Chlorophyll a 2018. Fish Tissue (Mercury) is in Category 3 because the Trophic Weighted Residue concentration is between 0.25 and 0.30 mg/kg.
GAR031300010820	Forsyth, Hall	Drinking Water, Recreation, Fishing	1,77	NP, UR	Acres		
Lanier Lake	Dam Pool	Chattahoochee	Not Supporting	Chlorophyll a	7245	4a	TMDL completed Chlorophyll a 2018. Fish Tissue (Mercury) is in Category 3 because the Trophic Weighted Residue concentration is between 0.25 and 0.30 mg/kg.
GAR031300010821	Gwinnett, Hall, Forsyth	Drinking Water, Recreation, Fishing	1,77	NP, UR	Acres		
Lanier Lake	Bolling Bridge	Chattahoochee	Not Supporting	Chlorophyll a	6059	4a	TMDL completed Chlorophyll a 2018. Fish Tissue (Mercury) is in Category 3 because the Trophic Weighted Residue concentration is between 0.25 and 0.30 mg/kg.
GAR031300010705	Hall, Forsyth, Dawson	Drinking Water, Recreation, Fishing	1,77	NP, UR	Acres		
Oliver Lake	Near Columbus	Chattahoochee	Not Supporting	Fish Tissue (Chromium), Fish Tissue (PCBs), Fish Tissue (Antimony)	2150	4a, 5	TMDL completed Fish Tissue (PCBs) 1998. The water is supporting its Drinking Water and Recreation Uses, but not its Fishing Use.
GAR031300021304	Muscogee	Drinking Water, Recreation, Fishing	1,37	NP	Acres	2032	
Unicoi Lake	Unicoi State Park	Chattahoochee	Supporting		53	1	
GAR031300010110	White	Fishing, Recreation	58		Acres		
Walter F. George Lake	Mid-Lake (U.S. Hwy 82) to Dam Forebay	Chattahoochee	Not Supporting	Chlorophyll a	29890	5	TMDL completed Fish Tissue (PCBs) 1998.
GAR031300031304	Quitman, Clay	Recreation, Fishing	1,33	NP, UR	Acres	2027	
Walter F. George Lake	Dam Pool	Chattahoochee	Not Supporting	Chlorophyll a	16863	5	TMDL completed Fish Tissue (PCBs) 1998.
GAR031300031601	Clay	Recreation, Fishing	1,33,58	NP, UR	Acres	2027	

APPENDIX M
Billing Schedule

CUMMING UTILITIES

UTILITIES RATE & FEE SCHEDULE (Adopted February 15, 2022)

ALL RATES BELOW APPLY TO BILLS GENERATED April 1, 2022 OR LATER

WATER RATES ARE EFFECTIVE APRIL 1, 2022 THROUGH DECEMBER 31, 2022. NEXT INCREASE WILL OCCUR ON JANUARY 1, 2023

Establishing Service *New customers please completed an ON-LINE application and upload a valid Georgia Driver's License or picture ID with date-of-birth and proof of property ownership / rental (deed, lease, or rental agreement). Residential security deposit of $125.00 per customer (refundable upon service termination with final bill paid in full). Minimum commercial security deposit of $125.00 per customer (Ord of 2-18-2014 , § 111- 58)*

Billing Charges

Credit Card Processing Fee	3%	of payment amount (one-time payment or auto draft
Auto Draft from Checking	0	No Charge
Late Payment Fee	10%	of total past due amount per month
Reconnection Fee	$40.00	Contact us during business hrs M-F 8am-4pm
Returned Check (Insufficient Funds)	$25.00	Contact us during business hrs M-F 8am-4pm

RESIDENTIAL WATER RATES *Inside or Outside refers to Corporate City Limits - See Service Area Map

CATEGORY	TIER	GALLONS USED	COST	COST APPLIED
RESIDENITAL 3/4"-5/8" METER (INSIDE)	Base Fee	0-1000	$10.32	FLAT FEE
	Tier 1	1000-6000	$2.91	PER 1000 GALLONS
	Tier 2	6000-12000	$3.94	PER 1000 GALLONS
	Tier 3	12000-24000	$5.51	PER 1000 GALLONS
	Tier 4	24000-36000	$7.82	PER 1000 GALLONS
	Tier 5	36000+	$11.35	PER 1000 GALLONS
RESIDENITAL 3/4"-5/8" METER (OUTSIDE)	Base Fee	0-1000	$13.77	FLAT FEE
	Tier 1	1000-6000	$3.88	PER 1000 GALLONS
	Tier 2	6000-12000	$5.25	PER 1000 GALLONS
	Tier 3	12000-24000	$7.35	PER 1000 GALLONS
	Tier 4	24000-36000	$10.43	PER 1000 GALLONS
	Tier 5	36000+	$15.13	PER 1000 GALLONS

SENIOR CITIZEN DISCOUNTS: 62-years and older with a photo ID - eligible for a reduced residential bill - call (770) 781-2020

SR discount inside city limits: 60% reduction in water rates and 5% discount on sewer rates.

SR discount outside city limits: $3.00 reduction on base water rate (to $10.77/month) only and no discount on sewer.

BASE WATER RATES - COMMERCIAL AND INDUSTRIAL IN/OUT BY METER SIZE

METER SIZE	3/4-5/8	1-INCH	2-INCH	3-INCH	4-INCH	6-INCH	8-INCH	10-INCH	12-INCH
Includes use of first 1000 GALLONS /Mo	$13.77	$16.75	$21.75	$101.00	$135.00	$275.00	$505.00	$625.00	$825.00

COMMERCIAL WATER RATES *Inside or Outside refers to Corporate City Limits - See Service Area Map

COMMERCIAL	Base Fee	0-1000	see above	FLAT FEE
AND INDUSTRIAL (IN AND OUT)	Uniform Rate	1000-any	$4.26	PER 1000 GALLONS

Note: Per the most recent Water and Sewer Rate Resolution dated February 15, 2022, the annual water rate increase shall be 3.5% and the annual sewer rate increase shall be 5% of the prior year's rate. These annual rate increase (on January 1st of each year) will be effective through January 1, 2028 with the final increase being on January 1, 2028, unless changed by the Cumming City Council. These rate increases will serve to cover the costs associated with operations, maintenance, and replacement of depreciated assets.

*IRRIGATION BASE WATER RATES - BY METER SIZE									
METER SIZE	3/4-5/8	1-INCH	2-INCH	3-INCH	4-INCH				
Includes use of first 1000 GALLONS /Mo	$13.77	$17.21	$34.42	$103.27	$143.45				

IRRIGATION WATER RATES – RESIDENTIAL AND COMMERCIAL				
CATEGORY	**TIER**	**GALLONS USED**	**COST**	**COST APPLIED**
IRRIGATION (ALL RES OR COMM)	Base Fee	0-1000	*see irrigat base rates above	FLAT FEE
	Tier 1	1000-6000	$7.76	PER 1000 GALLONS
	Tier 2	6000-12000	$11.64	PER 1000 GALLONS
	Tier 3	12000-24000	$15.53	PER 1000 GALLONS
	Tier 4	24000-36000	$19.40	PER 1000 GALLONS

SEWER RATES				
CATEGORY	**TIER**	**GALLONS USED**	**COST**	**COST APPLIED**
RESIDENTIAL	Base Fee	0	$8.63	FLAT FEE
	Uniform Rate	0 - ANY	$7.18	PER 1000 GALLONS
COMMERCIAL - INDUSTRIAL	Base Fee	0	$37.51	FLAT FEE
	Uniform Rate	0 - ANY	$7.67	PER 1000 GALLONS
SEPTIC WASTE DUMP FEE @ AWRF			$0.15	PER GALLON RECEIVED
(Note: The City reserves the right tor reject septic waste or other hauled wastes)				

GARBAGE RATES			
Garbage Service-Residential 1 p/u per wk	No Recycling $18/mo	W/Recyling $22/mo	Additional pickups are $15/ea
Garbage Service-Commercial 1 p/u per wk	No Recycling $23/mo	W/Recyling $27/mo	Additional pickups are $15/ea

STORMWATER (INSIDE City Limits Only)	
STORMWATER ASSESSMENT FEE	(Reserved for Ord. of 2-18-2014 , § 111- 342)

HYDRANT METER		GALLONS USED	COST	COST APPLIED
3/4"-5/8" HYDRANT METER	Base Fee	0	$25.00	FLAT FEE
		0 - ANY	$5.25	PER 1000 GALLONS
3" HYDRANT METER	Base Fee	0	$101.00	FLAT FEE
		0 - ANY	$5.25	PER 1000 GALLONS
Water Meter-Fire Hydrant Deposit**	3/4-inch	$250.00		PER METER
$225.00 refundable less water used at current rates and when returned in good condition				
Water Meter-Fire Hydrant Deposit**	3-inch	$1,000.00		PER METER
$750.00 is refundable less water used at current rates and when returned in good condition				
FIRE HYDRANT RENTAL CONTRACT MUST BE RENEWED EACH MONTH ON THE 15TH DAY OF THE MONTH.				
Hydrant bill will be generated and payment must be remitted each month for water used per 1000-gallons plus base fee (see above)				

SPECIAL WATER SERVICE FEES			
CATEGORY	**METER SIZE**	**COST**	**COST APPLIED**
Water meter test at customers request	3/4-inch	$100.00	PER METER
	1-inch or larger	$350.00	PER METER
Water meter relocation at customer request	3/4-inch	$2,200.00	PER METER
	1-inch or larger	$3,800.00	PER METER
Water Laboratory Testing		$35.00	PER METER
(Coliform Bacteria test by City Potable Water Production Facility Laboratory)			
Water Meter (Stolen-Damaged-Moved-Misplaced)		$2,200.00	PER METER PER DAY
(including but not limited to damage to meter, register, antenna, backflow, meter box, lid, curb stop)			
Water Meter & Lock (Tampering-Lock Removal)		$300.00	PER METER PER DAY
(including but not limited to tampering with lock, meter box, meter, antennea, lid, curb-stop, or other appurtenances)			
Reprint a water bill		$5.00	PER BILL

WATER SYSTEM CAPACITY FEES
MULTI-UNIT property water capacity fee is calculated as number of units X 3/4-inch meter cost per unit
All sub-metered customers will incur a water, sewer, and garbage base fee for each metered unit

WATER SYSTEM CAPACITY FEES CONTINUED			
SINGLE-UNIT	**METER SIZE**	**COST**	**COST APPLIED**
WATER METER CHARGE	3/4-5/8-INCH	$2,200.00	PER METER
(Installation costs not included)	1-INCH	$3,800.00	PER METER
	2-INCH	$11,500.00	PER METER
	3-INCH	$22,000.00	PER METER
	4-INCH	$37,000.00	PER METER
	6-INCH	$75,000.00	PER METER
	8-INCH	$119,000.00	PER METER
Above Elevation 1280 MSL - see elevation map	3/4-5/8-INCH	$6,250.00	PER METER

SEWER SYSTEM CAPACITY FEES		
CATEGORY	**COST**	**COST APPLIED**
RESIDENTIAL	$7,500.00	per residential unit
COMMERCIAL*	$30.00	per gpd daily avg water use
INDUSTRIAL	$30.00	per gpd daily max water use

* Commercial High Water Users capacity fee will be based on maximum daily gpd water usage.

Notes: Customers must comply with the City's Cross Connection Control Ordinance for backflow prevention.

Food Service Establishments require a minimum exterior 1000-gallon grease interceptor. See Cumming Utilities Ord.

STORMWATER IMPACT FEES (INSIDE City Limits Only)	
STORMWATER RATES	(Reserved for Ord. of 2-18-2014 , § 111- 342)

SEWER SYSTEM SURCHARGE FEES

Additional surcharges may be levied against customers whose effluent strength or concentration is received at the City's AWRF or within the sewer system, and/or discharged directly to the environment. A pretreatment permit fee may apply (Ord. of 2-18-2014 , § 111- 143)

SURCHARGE CATEGORY	TIER	CONCENTRATION (mg/L)	COST	COST APPLIED
BOD_5 (5-day BOD)	Tier 1	201-300	$0.20	per lb recvd. by AWRF
(200 mg/L max. allowable)	Tier 2	301-400	$0.45	per lb recvd. by AWRF
	Tier 3	401-500	$0.90	per lb recvd. by AWRF
	Tier 4	500 above	$1.80	per lb recvd. by AWRF

SEWER SYSTEM SURCHARGE FEES CONTINUED

SURCHARGE CATEGORY	TIER	CONCENTRATION (mg/L)	COST	COST APPLIED
COD (Chemical Oxygen Demand)	Tier 1	501-800	$0.20	per lb recvd. by AWRF
(500 mg/L max. allowable	Tier 2	801-1100	$0.45	per lb recvd. by AWRF
	Tier 3	1101-1500	$0.90	per lb recvd. by AWRF
	Tier 4	1500 above	$1.80	per lb recvd. by AWRF
TKN (Total Kjeldahl Nitrogen	Tier 1	41-60	$0.60	per lb recvd. by AWRF
(40 mg/L max. allowable)	Tier 2	61-80	$1.25	per lb recvd. by AWRF
	Tier 3	81-100	$2.50	per lb recvd. by AWRF
	Tier 4	100 above	$5.00	per lb recvd. by AWRF
P (Total Phosphorous)	Tier 1	4.1-5.0	$0.50	per lb recvd. by AWRF
(4.0 mg/L max. allowable)	Tier 2	5.1-7.0	$1.00	per lb recvd. by AWRF
	Tier 3	7.1-8.0	$2.00	per lb recvd. by AWRF
	Tier 4	8.0 above	$4.00	per lb recvd. by AWRF
NH-3 (Ammonia-as Nitrogen)	Tier 1	15.1-17.0	$0.60	per lb recvd. by AWRF
(15.0 mg/L max. allowable)	Tier 2	17.1-19.0	$1.25	per lb recvd. by AWRF
	Tier 3	19.1-20.0	$2.50	per lb recvd. by AWRF
	Tier 4	20.0 above	$5.00	per lb recvd. by AWRF
TSS (Total Suspended Solids)	Tier 1	221-300	$0.20	per lb recvd. by AWRF
(220 mg/L max. allowable)	Tier 2	301-400	$0.25	per lb recvd. by AWRF
	Tier 3	401-500	$0.50	per lb recvd. by AWRF
	Tier 4	500 above	$1.00	per lb recvd. by AWRF
FOG (Fats, Oils, & Grease)	Tier 1	51-65	$0.50	per lb recvd. by AWRF
(50 mg/L max allowable)	Tier 2	66-80	$1.00	per lb recvd. by AWRF
	Tier 3	81-100	$2.00	per lb recvd. by AWRF
	Tier 4	100 above	$4.00	per lb recvd. by AWRF
Chloride	Tier 1	101-600	$0.50	per lb recvd. by AWRF
(100 mg/L max. allowable)	Tier 2	601-999	$1.00	per lb recvd. by AWRF
	Tier 3	1000-1200	$2.00	per lb recvd. by AWRF
	Tier 4	1200 above	$4.00	per lb recvd. by AWRF

***Surcharges are additional sewer user fees assessed when wastewater characteristics exceed established discharge limits. The fees provide cost recovery for added treatment at the City's Advanced Water Reclamation Facility.**

CODE ENFORCEMENT FEES

A City of Cumming Utilities Ordinance Violation may incur a fee of $300 - $1,000.00 per day, per offense and/or as established in the City Ordinances. Includes, but is not limited to violations of the ordinances, any City issued permit (Industrial Pretreatment) or license, or violations which cause the City to violate any of its permits /licenses.

RIGHT-OF-WAY ENCROACHMENT FEES

CATEGORY (Small Cell O.C.G.A 36-66C-1.) (Buried Fiber in the ROW O.C.G.A.46-5-1)	COST	COST APPLIED
Buried Cable - RATE CLASS "U" for urban roads & streets (Ord. of 1-20-2009, § 20-20.26)	$5,000	per mile
Small-cell facility colocated on exiting pole in City of Cumming ROW	$250	per facility per year
Small-cell facility on a new or replacement pole in City of Cumming ROW	$200	per facility per year
Small-cell facility colocated on authority pole in City of Cumming ROW	$40	per facility per year
Permit for Collocation on existing pole in City of Cumming ROW	$100	one time per facility
Permit to install a repalcement pole & locate on new pole in City of Cumming ROW	$250	one time per facility
Permit to insall a new pole and locate facility on pole in City of Cumming ROW	$1,000	one time per facility

APPENDIX N
Drought Contingency Plan

DROUGHT CONTINGENCY and EMERGENCY WATER MANAGEMENT 2022

Prepared for:

CUMMINGUTILITIES
Sewer - Storm - Water

Prepared September 2, 2022

Prepared By:

CEC
CIVIL ENGINEERING CONSULTANTS, INC.
Civil & Environmental Engineering

City of Cumming
Drought Contingency and Emergency Water Management Plan

Contents

City of Cumming
Drought Contingency and Emergency Water Management Plan

Introduction

Drought management ensures contingency plans are in place to meet critical water needs for the area and reduce vulnerability of the water system to unplanned events. Emergency response plans also provide a readily available action plan should unforeseen incidences occur and can reduce critical reaction time. The goal of this plan is to cause a reduction in water demand and use in response to drought or emergency conditions for preservation of water availability. This plan has been prepared in advance considering conditions that will initiate and terminate water preservation.

Vulnerability assessments are required under the EPA's Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Community water systems serving more than 3,300 persons were required to complete a vulnerability assessment on all components of the system (surface water intake treatment plant, storage tank(s), pumps, distribution system and other important related system components). The Drought Contingency and Emergency Water Management Plan provides an update in accordance with the city's Water Master Plan, including a vulnerability assessment for the system and an emergency response plan that outlines specific response measures in the event of an incident. This update serves as part of the city's planning to implement policies and procedures for increased water system security and reliability.

The Director of Cumming Utilities will monitor usage patterns and public education efforts and make recommendations to city officials on future conservation efforts, demand management procedures or any changes to this plan. This plan works in conjunction with ongoing conservation programs which provide public awareness notices, bill stuffers, website notices and other methods as a constant reminder for water conservation at all times, not just during drought or emergencies. This review and evaluation is performed on a regular basis of five years as part of the city's local Water Master Plan unless conditions necessitate more frequent amendments.

The City of Cumming withdraws surface water from Lake Lanier for use as drinking water. Lake Lanier as part of the Upper Chattahoochee River Basin serves several large public water supply systems for raw surface water withdrawals in the region.

The raw water intake facility consists of two pumping stations. Station II consists of a 12-foot square wetwell with a bottom elevation of 1030.0 feet MSL with a 36-inch intake pipe 225 LF with a centerline elevation of 1033.50 feet MSL. The intake pipe riser will function for lake levels above 1042 feet MSL. The intake capacity is 48 MGD. Station III consists of a 43-foot diameter wetwell with a bottom elevation of 1017 feet MSL and a 66-inch diameter intake pipe 350 feet long with a centerline elevation of 1024.75 feet MSL. The intake capacity is 105 MGD.

Trigger conditions:
The Water Production Superintendent is responsible for monitoring water supply and demand conditions monthly (or more frequently when conditions warrant) and shall determine based on this plan when conditions warrant initiation or termination of each stage of the plan. The

The triggering conditions described below assess the vulnerability of the water source under record drought conditions as well as the production, treatment, and distribution capacities of the water system. The assessment also considers customer usage based on historical data.

Pursuant to the Rules for Drought Management, Section 391-3-30-.04, Drought Indicators and Triggers, the Director of EPD monitors climatic indicators and water supply conditions to assess drought occurrence and severity, and its impact upon the ability of public water systems to provide adequate supplies of water.

I. Drought Condition Indicators:

Lake Lanier has a normal pool water surface elevation of 1071.00 M.S.L. Seasonal draw down of approximately three feet occurs in the summer to allow for maintenance of boat docks. The water distribution supervisor is responsible for monitoring Lake Lanier levels, finished water storage and clearwell levels on a regular basis for early drought detection.

One of the earliest indicators and/or determination of drought conditions is the supervisor's monthly review of the Ga. EPD Drought Indicators Report which provides key information for Precipitation, Streamflow, Groundwater, Reservoir levels, Short term climate predictions, Soil moisture, and Water supply conditions.

The EPD report also compares current conditions to historical levels for the following:

1. Precipitation during the prior 3, 6, and 12 months;
2. Streamflow at the select United States Geological Survey gages;
3. Groundwater levels at select United States Geological Survey monitoring wells;
4. Reservoir levels at Lake Lanier, as well as Allatoona Lake, Lake Hartwell and Clarks Hill Lake

There are three levels of drought response available to the EPD Director. The response level is determined by the severity of the drought conditions and the ability of the public water system to meet demand for water and avoid a shortage of water in the impacted areas. Drought response declarations apply to EPD permitted groundwater and surface water systems.

Drought Response Level 1
Requires permitted public water systems to conduct a public information campaign to explain drought conditions and the need to conserve water. The campaign shall include one or more of the following: newspaper advertisements, bill inserts, website homepage, social media and

good stewards of our water resources.

In addition to the requirements under Drought Response Level 1,
Drought Response Level 2
Limits outdoor watering of landscape to two days a week determined by odd and even numbered addresses. This includes maintaining ground cover, trees and shrubs. Even numbered addresses may water on Wednesday and Saturday between 4:00 p.m. and 10:00 a.m. Odd numbered addresses may water Thursday and Sunday between 4:00 p.m. and 10:00 a.m. The following outdoor water uses are prohibited: washing hard surfaces such as streets and sidewalks, water for ornamental purposes such as fountains, the use of fire hydrants except for firefighting and public safety, washing vehicles, non-commercial pressure washing and fundraising car washes. Public water systems must also select and implement four or more items from a Drought Response Strategies Menu. Examples include an intense public information campaign, restaurants restricted to serving water only upon request, street cleaning prohibited and pool cover requirements.

Drought Response Level 3 (Additional measures)
All landscape watering is prohibited when for the purpose of maintaining ground cover, trees and shrubs. Watering of personal food gardens can only be done from 4:00 p.m. to 10:00 a.m. unless using drip irrigation or soaker hoses. Other allowable water uses include hand watering between 4:00 p.m. and 10:00 a.m., watering of athletic fields or public turf grass recreation areas, watering of golf courses with some limitations, use of reclaimed wastewater subject to the rules and water use during professional installation of irrigation systems. All ten items from the Drought Response Strategies Menu must be implemented. Professional exemptions: certain business activities are exempt from the rule including commercial pressure washing, permanent car wash facilities, construction sites and the watering in of pesticides and herbicide on turf.

Under Drought Response Level 3, the City utilizes tiered conservation rates.

The following thirteen outdoor water uses also are allowed daily at any time of the day by anyone during non-drought conditions and Drought Response Level 1 and Level 2.
As described under Drought Response Level 3 some of these activities are subject to additional requirements under those conditions:
1. Commercial agricultural operations as defined in Code Section 1-3-3.
2. Capture and reuse of cooling system condensate or storm water in compliance with applicable local ordinances and state guidelines.
3. Reuse of gray water in compliance with Code Section 31-3-5.2 and applicable local board of health regulations adopted pursuant thereto.
4. Use of reclaimed waste water by a designated user from a system permitted by the Environmental Protection Division of the department to provide reclaimed waste water;
5. Irrigation of personal food gardens;
6. Irrigation of new and replanted plant, seed, or turf in landscapes, golf courses, or sports turf fields during installation and for a period of 30 days immediately following the installation date.
7. Drip irrigation or irrigation using soaker hoses.
8. Hand watering with a hose with automatic cutoff or handheld container.

9. Use of water withdrawn from private water wells or surface water by an owner or operator of property if such well or surface water is on said property;
10. Irrigation of horticultural crops held for sale, resale, or installation.
11. Irrigation of athletic fields, golf courses, or public turf grass recreational areas;
12. Installation, maintenance, or calibration of irrigation systems; or
13. Hydroseeding.

If necessary, the City of Cumming will obtain a variance from EPD for more stringent conservation practices in the event conditions deem increased conservation to ensure public water supply according to those priorities below.

II. Potable Water Use Priorities:

A. Water Use Priorities

Listed below, from most to least important, are the City of Cumming's water use priorities.

1. Emergency facilities using potable water for essential life support measures.

2. Agricultural use.

2. Domestic and personal uses of potable water including drinking, cooking, washing, and sanitary and health related purposes.

3. Industrial/commercial uses of potable water including hotels, shopping centers, grocery stores, car washing facilities, etc.

4. Residential and commercial outdoor uses of potable water including lawn sprinkling, non-commercial car washing, gardening, etc.

B. Stored Water Accounting:

The combined stored water volume in the City's elevated storage tanks and clearwells is another good indicator for drought conditions. Storage water volume will be tracked by a procedure referred to as "Stored Water Accounting". This procedure tracks all storage volumes will be continuously tracked starting at 6 a.m. each day providing daily totals. Water production scheduled for each day should be based on the prior day's volume of water produced, adjusted by the change in combined storage volume.

The City of Cumming has an adopted Priority Use System in their Ordinances.

C. Restrictions on Lower Priority Uses (Including Enforcement Procedures):

As previously explained the restrictions will start with voluntary banning and end with mandatory priority curtailment. The City of Cumming will enforce any water bans with warning citations, fines or, if necessary, removal of the water meter. Enforcement of these procedures will be by City of Cumming Police Department or Forsyth County Sheriff's Department, whichever is applicable. The effectiveness of the water ban will be determined by continued observance of reductions in potable water demand at the water treatment plant.

D. Emergency Procedures:

The City's new raw water intake facility with a lowered intake protects against drought conditions when water levels fall below the normal pool elevations of 1071.0.

III. Low Flow Protection

IV. Storage of Finished Water:

The City of Cumming water system has the following, proposed storage facilities.

City of Cumming	Storage Capacity (MG)
Existing Clearwells	3.18
Existing Finished Water Storage Tanks	6.80
Planned Clearwells/Storage Tank	12.75
Total Storage Capacity	22.73

The above listed storage capacities are not intended for drought protection. The storage facilities were designed as part of the water distribution system providing storage for hourly fluctuations of water demand and to meet fire protection flows. These storage facilities allow the water system to supply water with consistent flow to its customers only during normal conditions. As with the surrounding County and municipalities, the City relies on the storage capacity of Lake Lanier during periods of drought. Lake Lanier is expected to provide long-term storage when flows across the Chattahoochee River Basin are less than the needed withdrawals.